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FINAL REPORT

**Phase-Out of the Use of Methyl Bromide
in Grain Storage in Indonesia
2006-2007**

UNIDO's project number: MP/INS/04/137



**MINISTRY OF ENVIRONMENT
REPUBLIC OF INDONESIA**



**UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION**

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PREFACE

The Multilateral Fund through the United Nations Industrial Development Organization (UNIDO) granted funds to the Government of Indonesia to carry out the program on the phase-out of the use of Methyl Bromide in grain storage in Indonesia (UNIDO's project number: MP/INS/04/137). The implementation of the program is coordinated by the Ministry of Environment (KLH). This report contains all activities which have been conducted for two years (2006 – 2007). In general the project was very successful in term of target achievements.

I would like to express my sincere appreciation and thanks to UNIDO as the Implementing Agent, BIOTROP as National Implementing Institution, Dr. Purnama Hidayat as the National Project Coordinator. I would like extend my thanks Department of Agriculture, Plant Quarantine Agency, Department of Trade, Department of Industry, Department of Finance, Department of Health for good collaboration in preparing regulations of Methyl Bromide import and distribution. Thanks to BULOG, PT Eastern Pearl Flour Mills, and PT Garuda Foods, PT Berdikari and IPPHAMI for the invaluable contribution in Phosphine Fumigation and Integrated Stored Pest Management training.

The phase-out program will never been successful without any support and collaboration all stakeholders. I hope this good collaboration and relationship among stakeholders will always be maintained for the seek of the Ozon Protection.

Jakarta, March 2008

Deputy for Environmental Degradation Control and
Natural Resources Conservation Development,
Ministry of Environment, Republic of Indonesia.

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CHAPTER I

INTRODUCTION

1-1. BACKGROUND

The Multilateral Fund through the United Nations Industrial Development Organization (UNIDO) granted funds to the Government of Indonesia to carry out the program on the phase-out of the use of Methyl Bromide in grain storage in Indonesia. The implementation of the program is coordinated by the Ministry of Environment (KLH). The aim of the project is to phase-out Methyl Bromide (MB) used for grain fumigation in Indonesia in 2008.

The phase-out programs include 1) public awareness, 2) policy and regulation, 3) preparing moduls and guidelines for phosphin fumigation and ISPM training , 4) training of phosphin fumigation, 5) training for trainers on integrated storage pest management : on site development, 6) regional training course on integrated storage pest management, and 7) refreshment training in phosphine fumigation good practices. Public awareness and policy/regulation programs concerning with Methyl Bromide is carried out by the KLH. Other programs are carried out by BIOTROP under supervsion of the KLH.

Some activities to be carried out after the Training on Integrated Storage Pest Management . will be continued by the Training for Trainers on Integrated Storage Pest Management : on-Site Development , which activities cover the implementation and monitoring of integrated storage pest management in the respective participating institutions. Presently, the implementation of integrated storage pest management by the participants who have attended the mentioned training is still on-going starting May to October 2006. Monitoring of the implementation activities of integrated storage pest management in the participants respective institutions/work places is planned to be carried out in September 2006. The Organizing Committee of the training will monitor the implementation activities of integrated storage pest management carried out by the participants in their respective institutions/work places.

1-2. GOALS

The goals of the projects are:

1. All stakeholders aware that phase-out of the use of MB for non-QPS will be effective in 2008
2. All users adopted MB alternative for non-QPS purposes
3. There is an effective system to control illegal import, distribution and use of MB to make sure there is no MB used for non-QPS in year 2008 and after

CHAPTER II

PROGRAM COMPONENTS AND ACTIVITIES

The program components and activities below are based on project document agreement between UNIDO and Ministry of Environment, Republic of Indonesia contract no 2005/174.

Component 1: Phosphine Fumigation Training:

1.1. Target Group:

- Good Practices Training: Fumigation technicians from private fumigation, rice storage, milling companies (50 technician)
- Public Awareness Seminars: At least 100 key actors associated with grain storage, agriculture and environmental policy in Indonesia.

1.2. Description of Activities:

a) Development and Reproduction of phosphine fumigation training manual:

A phosphine fumigation training manual will be developed to be used in training workshop.

b). Phosphine Fumigation Training Workshops:

three-day training workshops will be conducted with the participation of 50 fumigation technicians. They will be trained in good phosphine fumigation practices, including:

- Characteristics of phosphine and its role in pest management
- Phosphine product labelling
- Safe transportation and storage of phosphine
- Safe handling of phosphine; use of necessary protective equipment for phosphine use.

- Calculating phosphine dosages.
- Establishing gas tightness: importance and techniques.
- Exposure periods, airing periods.
- Proper use of phosphine meters.
- Post-fumigation activities: residues, containers, etc...
- Phosphine fumigation and integrated storage pest management

c). Refreshment Training in Phosphine Fumigation Good Practices:

The fumigation technicians previously trained in phosphine fumigation good practices will receive refreshment training approximately 1 year after having received the original training. These one-day sessions will allow the fumigation technicians to collectively share and discuss issues, problems and innovations related to good phosphine fumigation practices, get updated on any new techniques or procedures in the field and get expert advice on specific issues. A total of 6 refreshment training sessions will occur, organized by the project coordinator for each of the participating fumigation companies.

d). Public Awareness Seminars:

Two single-day public awareness seminars will be held with the purpose of socializing the project's aims, activities and results. Key actors from the grain storage, agriculture and environmental policy sectors will be invited. One seminar will be organized at the beginning of the project in order to present the project and the problems associated with MB, ozone depletion and grain storage, while the second will be planned for the last year of the project in order to present initial project results and motivate other complimentary actions related to MB phase-out in Indonesia.

1.3. Expected Results:

- 50 fumigation technicians trained in good phosphine fumigation practices.
- At least 100 key actors with increased awareness of MB use and phase-out objectives and options.

Component 2: Integrated Storage Pest Management (ISPM) Training:

2.1. Target Group:

- Fumigation technicians, mill operators, and technicians from rice storage facilities.
- ISPM Train the Trainers: 10 technicians from various regions of the country (covering all major rice-producing and storing regions in the country).
- ISPM Regional Training Workshops: 100 technicians

2.2. Description of Activities:

a). Development and Reproduction of ISPM training manual:

An ISPM training manual will be developed to be reproduced and used in the Train the Trainers workshop, as well as the ISPM Regional Training workshops. It is anticipated that a final draft version of the manual be used and validated in the Train the Trainers workshop so that a final version may be used in the Regional Training workshops. There will be several components to the manual that would include, but are not limited to receiving practices, sampling, warehouse sanitation, rice storage conditions conducive to pests, insect detection, stock rotation / segregation and determining the need for insecticide treatment.

b) Development and Execution of an ISPM Train the Trainers Workshop:

An international ISPM consultant will facilitate an ISPM Train the Trainers workshop, in coordination with the project coordinator. Over 5 days, 10 experts from various related organizations of the country (covering all major rice-producing and storing regions in the country) will participate in one day of seminars and four days of practical exercises.

c) ISPM Train the Trainers On-Site Development:

After successfully completing the Train the Trainers Workshop, each participant will be required to gain an additional 300 hours of "on site" hands-on work over a 6 month period. This "on site" portion will require each participant to be proficient at a set of defined ISPM tasks that will help them to become qualified ISPM trainers of millers, applicators, etc. They will be required to demonstrate their proficiency by implementing the tasks in a facility or show that they have been successful at implementing the tasks at a facility where they were training. Each participant will be monitored and evaluated over the six month period in order to ensure that the participant has acquired the necessary skills and abilities to train other future technicians.

The On-site Development portion of the Train the Trainers program will be developed and monitored by the international consultant. The execution of monitoring and evaluation of the participants in situ will be the responsibility of the project coordinator and/or other personnel hired under the "On-Site Development of Trainers" budget line.

d) ISPM Regional Training Workshops:

Once the regional trainers have been trained, each will conduct ISPM training workshop in their region to the rice fumigation, mill and storage technicians. Each of these workshops will use the ISPM manual developed and will include one day of seminars and four days of practical exercises. A national total of 100 technicians will be trained by the end of the program. The coordination and execution of the Regional Training Workshops will be done by the project coordination along with each regional trainer.

2.3. Expected Results:

- 10 trainers trained in ISPM.
- ISPM Training Manual developed, validated, reproduced and distributed to at least 100 rice storage technicians.
- At least 100 rice technicians trained in ISPM.

Component 3: Provision of Basic Equipment for Methyl Bromide Phase-Out:

3.1. Target Group:

- Phosphine fumigation good practices equipment for 24 company/organization teams that have been trained in good phosphine fumigation practices through this project.
- ISPM equipment for 24 company/organization teams that have been trained in good ISPM rice storage practices through this project.

3.2. Description of Activities:

a) Development of Equipment Provision Strategy:

The project will develop a strategy for the provision of equipment supplied through this project's funding. This strategy will address for whom, how and why equipment will be provided. It will be developed by the project coordinator, in consultation with all project stakeholders.

b) Use and Distribution of Equipment:

The equipment will be distributed according to the provision strategy developed. However, limited number of phosphine fumigation and ISPM equipment will be used to facilitate the training of technicians.. This equipment will include the following items:

Materials and EquipSPMent for Phosphine Fumigation
Cover plastic sheets 33x33 m
Recycled base sheet 150 μ PE, 2 rolls of 50 kg, 700m ²
Sand snakes/chain
Gas sampling lines (m)
Phosphine meters high concentrations

Phosphine meters for low concentrations
Full face gas masks,2/team, B2 filters, 5/mask
Sprayer
Safety (2 mist A2P3 canisters/mask)
Materials and Equipment for ISPM
Vacuum cleaner
Digital Thermometers Units
Thermocouples (30 metres each)
25 cm probes
Flashlights
Hand lens
Sieves for rice with catchpan
Sampling probe
Plastic Pheromone Monitoring Stations
Pheromones for crawling beetles
Pheromones for moths

3.3. Expected Results:

- 24 company / organization teams equipped for implementing phosphine fumigation good practices.
- 24 company / organization teams equipped for implementing ISPM good practices.

Component 4: Project Monitoring:

4.1. Target Group:

- N/A

4.2. Description of Activities:

The project coordinator will also perform the activities of monitoring the project, its activities, products and results. This will be done in conjunction with the implementing agency, UNIDO, which will be responsible for submitting project progress reports at least once every six months.

The monitoring and reporting of project activities, products and results will require the establishment of clear indicators as well as the means of verification of these indicators. It will be important not just to indicate the project's successes in executing activities properly, but also clearly demonstrating how these activities have effectively led to changes in rice storage and handling practices and, eventually, Methyl Bromide use.

As such, a monitoring framework will be established by the project coordinator in conjunction with key consulting experts on project monitoring methodologies. The NOU, UNIDO and Environment Canada will participate actively in the development of the framework, which will be the basis for project reporting.

4.3. Expected Results:

- Project monitoring framework established.
- Project progress reports submitted to Environment Canada at least every six months.
- Information on project's level of efficiency and effectiveness readily available.

CHAPTER III

PUBLIC AWARENESS AND DISSEMINATION

3.1. SEMINAR

There were two seminars have been conducted. The first was on 14th of February 2006 and the second was on 20 November 2007. The seminar was the way to socialize the strategy of the program on ozone layer protection and phase-out of the use of methyl bromide in grain storage in Indonesia.

The First Seminar

The seminar on the Program of the Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia was held on 14 February 2006 at Harris Hotel, Jakarta. This seminar played an important role as a starting point to socialize the concern of Indonesia to the global program regarding phasing out of the use of methyl bromide. At the same time, this seminar also gave some additional input/perceptions to experts in the fields of fumigation, agriculture, grain storage and related institution to be more aware of the ozone layer damage due to the use of methyl bromide. The program of the seminar is presented in Appendix 2. The seminar was started at 9.30 am with opening address by Dr. Handoko in his capacity as SEAMEO BIOTROP Director and organizer of the seminar. The representative of UNIDO Jakarta, Mr. Masayoshi Matsushita, as the sponsor also presented his remarks. Mrs. Masnellyarti Hilman, MSc., Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control as Director of the national Project on "Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia" delivered her remarks and officially declared the opening of the seminar. Some pictures of the seminars are presented in the Appendix 6.

The first session on presentation and discussion started with the presentation of the Ministry of Environment on "Strategy and Program on the Protection of Ozone layer in Indonesia" which was delivered by Mrs. Sulistyowati, MSc. Assistant Deputy for Climate Change Impact Control. The following paper entitled "Explanation on the Program on Phase-out of Methyl Bromide in Grain Storage in Indonesia" was delivered by Dr. Purnama Hidayat as the National Project Coordinator (NPC). The presentation of the two papers was followed by a discussion chaired by Mrs. Tri Widayati, MS. of the Ministry of Environment.

The second session was a panel discussion on "Challenge of Phase-Out of the Use of Methyl Bromide in Indonesia". In this panel discussion session five papers were delivered by

the Department of Trade, Department of Agriculture (represented by Plant Quarantine Service of Agriculture Quarantine Agency and Center for Permit and Investment), Department of Health and the Entrepreneur Association for Pest Control (IPPHAMI).

The Department of Trade represented by Ms Yulia Niza Nida presented a paper on "Import Policy of Methyl Bromide". The Plant Quarantine Service represented by Mrs. Rindayuni Triavini, MSc. delivered a paper on "Challenge on the Phase-Out of the Use of Methyl Bromide (MB)", while the Centre for Permit and investment represented by Mr. Chairul Rachman, MM. presented a paper entitled "Challenge on the Phase-Out of the Use of Methyl Bromide on Health" was presented by Mr. Priagung Adhi Bawono, SKM, MMedSc (PH). The last paper was delivered by Mr. Jaka Priyono of IPPHAMI entitled "Challenge on the Phase-Out of the Use of Methyl Bromide". The discussion was chaired by Dr. Bambang Purwantara from SEAMEO BIOTROP.

There are 56 participants coming from UNIDO, Ministry of Environment, SEAMEO BIOTROP, Department of Agriculture represented by the Plant Quarantine Service, Agriculture Quarantine Agency and the Centre for Permit and Investment, Research and Development Institute for Post-Harvest, Department of Trade, department of Health, National Agency for Drug and Food Control (Badan POM), Department of Industry, Indonesian Entrepreneur Association for Pest Control, BULOG (previously National Logistics Agency), an agencies involved in the food and feed sector. The list of participants is shown in Appendix 3.

The seminar was officially closed by Tri Widayati, MS. of the Ministry of Environment.

The Second Seminar

The aim the second seminar was to disseminate the results of the program on phase-out of the use of methyl bromide in grain storage in Indonesia and to plan a policy that will be implemented to control the use of methyl bromide after its phase-out in Indonesia. The seminar was held at SEAMEO BIOTROP, Bogor, on 20 November 2007.

This seminar was attended by 78 participants coming from various institutions such as UNIDO, Ministry of Environment, SEAMEO BIOTROP, Bogor Agricultural University, Perum BULOG, Department of Health, Department of Agriculture, Customs Office, Department of Trade, fumigation service companies involve in Indonesian Pest Control Association (IPCA), agrochemical companies, estate enterprise, wood packaging enterprise, food and feed industries, methyl bromide importers, etc. The list of participants is presented in Appendix 1.

Resource persons who participated in this seminar were Dr. Purnama Hidayat (NPC); Dr. Okky Setyawati Dharmaputra (SEAMEO BIOTROP); Mr. Fasika Khaerul Zaman (Perum

BULOG), Mrs. Yulia Niza Nida (Department of Trade); Mrs. Yulia Purwanti, MM. (Centre for Permit and Investment); Soma Baskoro (Customs Office); Mr. Turhadi Noerachman (Plant Quarantine Service); Mrs. Tri Widayati, MT. and Mrs. Endang Pratiwi (Ministry of Environment); and Mr. Sunjaya (SEAMEO BIOTROP).

The seminar was divided into two sessions, i.e. panel discussion I (before break) and panel discussion II (after break), apart from the opening and closing sessions, and discussions concerning the expectation and the follow-up of activity on the program of phase-out of the use of methyl bromide in grain storage in Indonesia. The program of the seminar is presented in Appendix 2.

The seminar was started with an opening ceremony. At the opening program of the seminar, Mr. Ith Vuthy, MSc.MA (Deputy Director for Program and Marketing, SEAMEO BIOTROP), delivered the address on behalf of the Director of SEAMEO BIOTROP. Mr. Nahrudin Alie delivered an address from the Head of UNIDO Representative, Jakarta. The address of the Deputy Minister for Nature Conservation Enhancement and Environment Destruction Control, Ministry of Environment was delivered by Mrs. Sulistyowati, MM., Assistant Deputy for Climate Change Impact Control who officially open the seminar.

The session on panel discussion I was started with the presentation and achievement of the program on Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia, delivered by Dr. Pumama Hidayat, as National Project Coordinator. The next presentation was given by Dr. Okky Setyawati Dharmaputra, as the training coordinator of SEAMEO BIOTROP, on the success story of trainings on Phosphine Fumigation Good Practices and Integrated Storage Pest Management. The success story of the implementation of training results was represented by Perum BULOG and PT Eastern Pearl Flour Mills. Explanation on the implementation of Integrated Storage Pest Management (ISPM) in Perum BULOG was delivered by Mr. Fasika Khaerul Zaman, while a paper from PT Eastern Pearl Flour Mills entitled "Implementation of ISPM in PT Eastern Pearl Flour Mills through HIT (Hygiene Integrated Team) as Alternative to Methyl Bromide" was not presented orally, due to unavoidable circumstances of the staff concerned, i.e he should be in his office at the same date of the seminar. Both enterprises (Perum BULOG and PT Eastern Pearl Flour Mills) were appointed for representing enterprises whose staff have participated in the training on phosphine fumigation and ISPM. Apart from that, the enterprises have succeeded in implementing the training results, especially the implementation of ISPM with the full support from their enterprise managements. The presentation of papers on panel discussion I was

followed by panel discussion of each speaker with Dr. Hariyadi Halid from Perum BULOG as the moderator.

The session on panel discussion II was divided into two subject matters, i.e. discussions on the policy and alternative technology of methyl bromide. The first explanation on the policy to control the use of methyl bromide after its phase-out in Indonesia was prepared by the Assistant Deputy for Climate Change Impact Control, Ministry of Environment, and presented by Mrs. Tri Widayati, MM. The next explanation was on Import Business Administration Determination of Ozon Depleting Substance (ODS) prepared by the Director General of Foreign Trade, Directorate Import, Department of Trade, and presented by Mrs. Yulia Niza Nida. The Policy on the Use of Methyl Bromide in Indonesia was prepared by Centre for Permit and Investment/Pesticide Committee, Department of Agriculture, and presented by Mrs. Yulia Purwanti, MM; the Role of Directorate General Customs Office in Controlling the Import of ODS was prepared by the Director of Taking Measures and Investigation, Directorate General Customs Office, Department of Finance, and presented by Mr. Soma Baskoro; Mechanism of Controlling the Circulation and the Use of Methyl Bromide at User Level prepared by Plant Quarantine Service and presented by Mr. Turhadi Noerachman. Each related institution presented their policies in the efforts to control methyl bromide either in its importation, distribution or utilization. The next session was a panel discussion with Mr. Abi Said Hudri from Plant Quarantine Service, as the moderator.

The explanation of Alternative of Methyl Bromide was presented by Dr. Purnama Hidayat. Some enterprises explained briefly the alternative technology of methyl bromide, i.e. Phosphine as An Alternative Fumigant to Replace Methyl Bromide (presented by Mr. Awaluddin Sarmidi, PT Agricon Putra Citra Optima/Terminix); Alternative Technology of Methyl Bromide : Vapormate, Sterigas, Cosmic (Wodek Jacobik, PT Linde Gas/PT BOC Gases Indonesia); Commercial Performance and Global Development Status of ProFume Gas Fumigant (Mr. Djoko Sunindyo, PT Dow AgroSciences Indonesia); and Alternative Technology of Methyl Bromide : The Use of Heat Treatment (HT) for Wood Packaging to be Exported (Budi Santoso, PT Karuna Sumber Jaya). After they presented alternative technology of methyl bromide, the following program was a panel discussion with Dr. Idham Sakti Harahap from the Department of Plant Protection, Faculty of Agriculture, Bogor Agricultural University, as the moderator.

Before the end of the seminar, a discussion was held on the expectation and follow-up on the use of methyl bromide in Indonesia. The discussion was led by Mrs. Tri Widayati, MT.

(Ministry of Environment), followed by Dr. Purnama Hidayat (NPC), Mrs. Endang Pratiwi (Ministry of Environment), and Mr. Sunjaya (SEAMEO BIOTROP).

The seminar was officially closed by the Head of Protection of Ozon Layer Sector, Ministry of Environment (Mrs. Tri Widayati, MT.).

3.2. PUBLICATION AND RADIO TALKSHOW

a. Desk planner and booklet.

Desk planner was made to disseminate information of the Methyl Bromide phase-out activities. The desk planner was produce in 2006 and distributed to the managers of the grain storages, fumigator companies, and some limited government officials. Booklet containing information of the Methyl Bromide phase-out activities will be produced in the end of the project.

b. Homepage of phase-out program of Methyl Bromide

A homepage was set up to disseminate information of the project of phase-out Methyl Bromide in grain storage in Indonesia. The URL address of the homepage is <http://ozon.menlh.go/id>. The contents of the homepage are:

- Activities of the phase-out programs of Methyl Bromide in Indonesia
- Policy and regulation related to Methyl Bromide in Indonesia
- FAQ about Methyl Bromide
- Links to various resources related to Methyl Bromide

The homepage will be updated regularly and as an addition to the existing internet based media, the indonesian Methyl Bromide mailing list.

2. Radio Talkshow

Radio talkshow was done twice in Indonesia Republic Radio of Bogor and the Agricultural Radio of Ciawi in 2007. The talks were mainly about Methyl Bromide phase-out and the ozone protection programs in Indonesia. The talks were live interaction, so listeners could make interactive discussion with the resource persons. The resource person were Dr. Purnama Hidayat of the NPC and a Faculty Member of Bogor Agricultural University and Ms. Endang Pratiwi of the Ozon Unit, Ministry of Environment.

CHAPTER IV

TRAINING COURSES

4.1. PRODUCTION OF MODULE AND MANUAL OF PHOSPHINE FUMIGATION AND INTEGRATED STORED PEST MANAGEMENT (ISPM)

The module and manual of Phosphine Fumigation Good Practices have been compiled from 17 January 2006 up to March 2006.

Compilation of modules and manuals of the Training on Phosphine Fumigation Good Practices aimed to facilitate the participants in understanding the given subjects/topics during the training and also as a guide book to carry out fumigation in the field.

The module on the Training Course on Phosphine Fumigation Good Practices contains the subjects/topics related with the training, while the manual is a practical guide for field workers of storage pest control or operators in charge of fumigation. Aside from that, fumigation manual contains general knowledge on phosphine and techniques of correct and proper application of phosphine fumigation.

The subjects and name of authors contain in the module of the Training Course on Phosphine Fumigation Good Practices are presented in Table below.

Subjects presented and name of authors contained in the module of the Training Course on Phosphine Fumigation Good Practices

No.	Subjects/Topics	Authors
1	- Problems on Global Environment <ul style="list-style-type: none"> • What is meant by problems on global environment ? • Atmosphere layer of the earth • What are ozone and ozone layer ? • What is meant by ozone hole ? • How is ozone formed and what is its use ? • What causes the occurrence of ozone hole • What danger could occur due to holes in the ozone layer? • International convention to protect ozone layer 	Staff of Ministry of Environment

2	<ul style="list-style-type: none"> - Towards the Phase-out of the Use of Methyl Bromide in Storages in Indonesia • Introduction • The use of methyl bromide • Methyl bromide as a substance destroying ozone layer • Alternative technique as a substitute for methyl bromide • The use of methyl bromide for quarantine and pre-shipment 	Dr. Purnama Hidayat
3	<ul style="list-style-type: none"> - General description of Phosphine Fumigation • General characteristics of phosphine • Phosphine labeling • Storage and handling of fumigants • Transportation of fumigants • Personnel and self-protection tool • Dosage rate and exposure period of phosphine • Economical analysis of the fumigant phosphine • Process of residue handling • Failure in fumigation • The effect of phosphine on storage fungi 	Mr. Samsul Arifin Ms. Mirna Milantina Mr. Erwin Cuk Surahmat Dr. Okky Setyawati Dharmaputra
4	<ul style="list-style-type: none"> - Phosphine Fumigation on Some Commodities • An introduction to fumigation practice • Fumigation • Dosage rate and exposure period of phosphine • Fumigation with phosphine • Application of phosphine fumigation 	Dr. Hariyadi Halid Mr. Samsul Arifin Ms. Mirna Milantina Mr. Erwin Cuk Surahmat

The materials contained in the manual for the Training Course on Phosphine Fumigation Good Practices have been compiled by Mr. Erwin Cuk Surahmat, Ms. Mirna Milantina, Mr. Samsul Arifin, Mr. Sunjaya and Mrs. Sri Widayanti. The subjects/topics are presented in Table below.

Subjects/topics of the manual for the Training Course on Phosphine Fumigation Good Practices

No.	Subjects/Topics
1.	Introduction of Fumigation
2.	Technical Requirement
3.	The Fumigant Phosphine
4.	The Process of Fumigation
5.	Process of Residue Handling
6.	Failure in Fumigation
7.	Storage and Transportation of Phosphine
8.	List of Important Storage Insect Pests which Could be Controlled by Phosphine Fumigation

The results obtained from the preparation of modules and manuals of the Training Course on Phosphine Fumigation Good Practices are in printed form. The modules and manuals on the Training Course on Phosphine Fumigation Good Practices have been distributed to the participants of the 1st Training Course on Phosphine Fumigation Good Practices, Training Course on Integrated Storage Pest Management, Regional Training Course on Integrated Storage Pest Management (Provinces : DKI Jakarta, West Java, Central Java, East Java, East Kalimantan, Banten and South Sulawesi), 2nd Training Course on Phosphine Fumigation Good Practices and the Use of Phosphine Fumigation Equipments, lecturers and personnel in relation with the activities of the program on phase-out of the use of methyl bromide in grain storage in Indonesia.

Another modul and manual is for Integrated Storage Pest Management. It has been compiled from 17 January 2006 up to April 2006. The compilation of module and manual of the Training on Integrated Storage Pest Management aimed to facilitate the participants in understanding the given subjects/topics during the training and also serve as a manual to implement integrated storage pest management in the field.

The module for Integrated Storage Pest Management contains materials discussed during the training, while the manual serves as a practical guide for field workers to carry out Integrated Storage Pest Management activities.

The subjects of the module for Integrated Storage Pest Management including the name of the authors are presented in Tables below.

Subjects/topics and name of authors contained in the module for Integrated Storage Pest Management

No.	Subjects/Topics	Authors
1	<p>- Problems on Global Environment</p> <ul style="list-style-type: none"> • What is meant by problems on global environment ? • Atmosphere layer of the earth • What are ozone and ozone layer ? • What is meant by ozone hole ? • How is ozone formed and what is its use ? • What causes the occurrence of ozone hole ? • Methyl bromide as destroying substance of ozone layer • What danger could occur due to holes in the ozone layer? • International convention to protect ozone layer 	Staff of Ministry of Environment
2	<p>- Towards the Phase-out of the Use of Methyl Bromide in Storages in Indonesia</p> <ul style="list-style-type: none"> • Introduction • The use of methyl bromide • Program on the phase-out of the use of methyl bromide in storages in Indonesia • Alternative technique as a substitute for methyl bromide • The use of methyl bromide in quarantine and pre-shipment. 	Dr. Purnama Hidayat
3	<p>- Integrated Storage Pest Management</p> <ul style="list-style-type: none"> • Understanding/introduction • Action threshold • Control components • Constrains in the implementation of the concept on integrated management of food commodities • Conclusion 	Dr. Purnama Hidayat Dr. Hariyadi Halid
4	<p>- Introduction of Storage Insect Pests</p> <ul style="list-style-type: none"> • The role of insects in the storage ecosystem • Characteristics and existence of storage insect pests 	Mr. Sunjaya Mrs. Sri Widayanti
5	<p>- Ecology of Storage Insect Pests</p> <ul style="list-style-type: none"> • Introduction • Population growth • Source of storage insect pest infestation 	Dr. Idham Sakti Harahap

	<ul style="list-style-type: none"> • The effect of environmental factor 	
6	<ul style="list-style-type: none"> - Storage Fungi in Grains <ul style="list-style-type: none"> • Field fungi • Storage fungi • Factors effecting the growth of storage fungi • The effect of fungal infection on grains • Prevention of storage fungal infection • Control of storage fungi 	Dr. Okky Setyawati Dharmaputra
7	<ul style="list-style-type: none"> - Population Monitoring of Storage Insect Pests <ul style="list-style-type: none"> • Introduction • The importance of monitoring • Insect species • Monitoring technique • The interpretation of monitoring results • Conclusion 	Dr. Dadang
8	<ul style="list-style-type: none"> - Sampling technique for commodities <ul style="list-style-type: none"> • Introduction • General procedure of inspection • Inspection of samples • Sampling Technique • Bulk of grains in truck • Conclusion 	Mr. Teguh M. Sardjono, MSc.
9.	<ul style="list-style-type: none"> - Pesticide Application for Controlling Insect Pests <ul style="list-style-type: none"> • The use of pesticides to control storage pests in Indonesia • The use of contact insecticides • Mode of action of insecticides • Factors influencing the residual effect of insecticides • Insecticide label and safety instruction • Determination/calculation for insecticide need • Fumigation • Mode of action of fumigant • The use of fumigant • Pesticide residue 	Mr. Djoko Prijono, MAgr.

	<ul style="list-style-type: none"> • Pest resistance against pesticides • Conclusion 	
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The materials of the manual for Integrated Storage Pest Management have been compiled by Dr. Idham Sakti Harahap, Mr. Sunjaya, Dr. Okky Setyawati Dharmaputra and Mrs. Sri Widayanti. The subjects/topics are presented in Table below.

Subjects contained in the manual for Integrated Storage Pest Management

No	Subjects/Topics
1	Introduction
2	Introduction of storage insect pests and storage fungal species
3	Design and structure of warehouse
4	Storage sanitation and its surrounding environment
5	Implementation of initial standard quality regulation of grains
6	Inspection and monitoring
7	Management of stock
8	Pesticides and fumigants application
9	Appendix 1. Inspection document sheet. Lecture : Integrated Commodity Management
10	Appendix 2. Registered pesticides to control storage pests in Indonesia
11	Appendix 3. Safety guide to work with pesticides

The obtained results from the compilation of modules and manuals of the Training for Trainers on Integrated Storage Pest Management are in printed form. The module and manual of the Integrated Storage Pest Management were distributed to the participants of the Training for Trainers on Integrated Storage Pest Management, Regional Training Course on Integrated Storage Pest Management (Provinces : DKI Jakarta, West Java, Central Java, East Java, East Kalimantan, Banten and South Sulawesi), 2nd Training Course on Phosphine Fumigation Good Practices and the Use of Phosphine Fumigation Equipments, lecturers and personnel in relation with the activities of the program on phase-out of the use of methyl bromide in grain storage in Indonesia.

4.2. TRAINING COURSE ON PHOSPHINE FUMIGATION GOOD PRACTICES

The courses on this matter was done twice. The first was in 2006 and the second was 2007.

The Firs Training

Training course was held at SEAMEO BIOTROP, Bogor, for three days from 27 until 29 March 2006. The objectives of the training were to provide the understanding and practice to conduct fumigation to the participants involved in fumigation, i.e. technicians/field workers or staff in charge of storage pest control.

This training was attended by 32 participants and 2 observers, coming from fumigation service companies, food and feed industries, as well as related institutions such as Perum BULOG, Plant Quarantine Service, Indonesian Centre for Agricultural Post Harvest Research and Development, Bogor Agricultural University (IPB), SEAMEO BIOTROP and Ministry of Environment (KLH). The list of participants, observers and lecturers of the Phosphine Fumigation Good Practices is presented as Tabel below.

The lecturers and instructors involved in this training were invited from the Ministry of Environment, Department of Plant Protection, Bogor Agricultural University (IPB); Perum BULOG, PT Berdikari, and SEAMEO BIOTROP.

The subjects for the Training on Phosphine Fumigation Good Practices have been prepared in the form of a module and a manual and given to the participants during the registration. Aside from those two (module and manual), guide books Guide of Grains Fumigation in the ASEAN Region (Book 1, 2 and 3) published by the Australian Centre for International Agricultural Research (ACIAR) in 1998 were also given to the participants. Book 1 discusses the "Principles and General Practice", Book 2 contains "Carbon Dioxide Fumigation of Bag-Stacks Sealed in Plastic Enclosures : an Operations Manual", while Book 3 on "Phosphine Fumigation of Bag-Stacks Sealed in Plastic Enclosures: an Operations Manual". Those three books were translated in Indonesian from the original book entitled : "Suggested Recommendations for the Fumigation of Grain in the ASEAN Region" published by the ASEAN Food Handling Bureau (AFHB) and ACIAR in 1989.

The complete program of the training on Phosphine Fumigation Good Practices is shown in Appendix.

At the first day, the training activities were conducted in the class room. The training course started with opening ceremony. During the opening ceremony, a report presented by the training coordinator (Dr. Okky Setyawati Dharmaputra) followed by remarks delivered by the Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment, delivered on her behalf by Mrs. Sulistyowati, MM, Assistant Deputy for Climate Change Impact Control. Hence, the training course was officially declared open by SEAMEO BIOTROP Director (Dr. Handoko).

After the opening session of the Training on Phosphine Fumigation Good Practices, the activity was started with an evaluation. The participants should answer an evaluation form which contains questions related to ozone layer, storage pest, fumigant and fumigation. The purpose of this was to evaluate the knowledge of the participants on the subject of the training. The activity was continued by socialization on methyl bromide and the program on its phase-out in Indonesia delivered by Mrs. Tri Widayati, MT from the Ministry of Environment and Dr. Purnama Hidayat from Bogor Agricultural University (IPB).

The lecture activities on the first day of the training were on General Information on the Fumigant Phosphine which was delivered by Ms. Mirna Milantina and the Effect of Phosphine on Storage Fungi delivered by Dr. Okky Setyawati Dharmaputra.

The activities for the second day of the training was held at PT Berdikari, Jakarta to carry out practicals on fumigation of containers containing cocoa beans. The activities for the third day of the training was conducted at the rice storage of Perum BULOG Sub Divre Cianjur, Divre West Java located at Darmaga, Bogor to carry out fumigation on bag stacks containing food commodities in the warehouse. The final evaluation of the participants relating their knowledge on ozone layer, storage pest, fumigant and fumigation was done after the practical on fumigation in the storages. Aside from that, in order to get information on the quality of the training program evaluation forms containing a series of questions were also given to the participants. Subjects to be evaluated by the participants cover academic aspect, field practical, services and facilities.

After the practical on fumigation and final evaluation, the training was officially closed. During the closing ceremony a report was delivered by Dr. Okky Setyawati Dharmaputra as the training coordinator. In her report the training coordinator mentioned about the success of the Training Course on Phosphine Fumigation Good Practices. The success of the training could be concluded from the results of early and final evaluations of the participants. The final evaluation showed a quite significant increase of result (value) which means that the participants knowledge on the subjects have been improved. At the closing ceremony

remarks were also delivered by the Ministry of Environment which was read by Mrs.Sulistyowati, MM. Hence, the training on the Phosphine Fumigation Good Practices was officially closed by Mr. Ith Vuthy, MSc., MA as Deputy Director from Program and Marketing of SEAMEO BIOTROP.

In general the participants provide inputs that the time period of the training should be extended, because three days is considered not sufficient to learn the theory and to conduct practical on phosphine fumigation. In addition this kind of training should be conducted regularly/frequently, although this training has been held successfully. The participants also suggested that the practical work on phosphine fumigation should be conducted in various kinds of storages (warehouses).

**LIST OF PARTICIPANTS, OBSERVERS AND LECTURERS OF
THE TRAINING COURSE ON PHOSPHINE FUMIGATION GOOD PRACTICES
SEAMEO BIOTROP, Bogor, 27 – 29 March 2006**

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PROGRAM OF THE TRAINING COURSE ON PHOSPHINE FUMIGATION GOOD PRACTICES
SEAMEO BIOTROP, Bogor, 27 – 29 March 2006

Day/Date/Time	Program	Lecturer
Monday, 27 March 2006		
08.00 – 09.00	Registration of Participants	
09.00 – 09.30	Opening Ceremony:	
	- Report by Training Coordinator	Dr. Okky S. Dharmaputra
	- Address by the Ministry of Environment	Mrs. Sulistyowati, MM.
	- Address by SEAMEO BIOTROP Director and Opening of the Training	Dr. Handoko
09.30 – 10.00	COFFE/TEA BREAK	
10.00 – 10.30	Early Evaluation of the Training	Organizing Committee
10.30 – 10.50	Strategy and program of ozone layer protection in Indonesia (Lecture)	Mrs. Tri Widayati, MT.
10.50 – 11.30	Towards phase-out on the use of methyl bromide in grain storage in Indonesia (Lecture)	Dr. Purnama Hidayat
11.30 – 12.30	Discussion	
12.30 – 13.30	LUNCH	
13.30 – 15.30	General description on phosphine fumigant (Lecture)	Ms. Mirna Milantina
15.30 – 15.45	COFFE/TEA BREAK	
15.45 – 17.00	The effect of phosphine on storage fungi (Lecture)	Dr. Okky S. Dharmaputra
Tuesday, 28 March 2006		
07.00 – 09.00	Departure to PT BERDIKARI Jakarta to conduct practical work on fumigation in containers	
09.00 – 10.00	Phosphine fumigation of containers containing commodities (Lecture)	Mr. Samsul Arifin Ms. Mirna Milantina
10.00 – 10.15	COFFE/TEA BREAK	
10.15 – 12.00	Fumigation of containers containing cocoa beans (Practical work)	Mr. Samsul Arifin Ms. Mirna Milantina
12.00 – 13.00	LUNCH	
13.00 – 15.30	Fumigation of containers containing cocoa beans (Practical work)	Mr. Samsul Arifin Ms. Mirna Milantina
15.30 – 15.45	COFFE/TEA BREAK	
15.45 –	Back to SEAMEO BIOTROP Bogor	
Wednesday, 29 March 2006		
08.00 – 09.00	Phosphine fumigation on bag stacks containing food commodities in storage (Lecture)	Dr. Hariyadi Halid
09.00 – 10.00	Departure to practical work location (milled rice storage Perum BULOG Darmaga Sub Divre Cianjur Divre West Java)	
10.00 – 12.30	Phosphine fumigation on bag stacks containing food commodities in storage (Practical work)	Dr. Hariyadi Halid Mr. Teguh M. Sardjono, MSc.
12.30 – 13.00	Final evaluation of the training	Organizing Committee
13.00 – 14.00	LUNCH	
14.00 – 15.00	Back to SEAMEO BIOTROP	
15.30 – 16.00	COFFEE/TEA BREAK	
16.00 – 16.30	Closing Ceremony	

The Second Training

This training course was about phosphine fumigation good practices. The first training course has been conducted at SEAMEO BIOTROP on 27 – 29 March 2007. The difference of both training course is on the second training course, participants received grant equipments for phosphine fumigation and integrated storage pest management (ISPM) from UNIDO through Ministry of Environment and SEAMEO BIOTROP.

The training was held at SEAMEO BIOTROP, Bogor, Indonesia and New Warehouses [*Gudang BULOG Baru (GBB)*] Darmaga Perum BULOG Subdivre Cianjur, Divre West Java on 13 - 14 August 2007.

This training aims to provide the understanding and practice to conduct phosphine fumigation and the use of phosphine fumigation and integrated storage pest management equipments to the participants involved in fumigation.

This training was attended by 41 participants and 2 observers, coming from fumigation service companies, food industries, grain storage (Perum BULOG) and government institutions. The list of participants and observers of the 2nd Training Course on Phosphine Fumigation Good Practices and the Use of Phosphine Fumigation Equipments is presented in Appendix 1.

The lecturers and instructors involved in this training were Mrs. Endang Pratiwi (Ministry of Environment), Dr. Purnama Hidayat (National Project Coordinator); Mr. Rahul Singh (United Phosphorus Limited/UPL), Mr. Ade Syaefurrohman (PT Berdikari), Mr. Teja Sukmana (PT Berkat Niaga Dunia), Mr. Sunjaya and Mrs. Sri Widayanti (SEAMEO BIOTROP). The list of lecturers and instructors is presented in Table below.

The materials for this course have been prepared in the form of a module and a manual and given to the participants during the registration.

On the first day, the training activities were conducted in the class room of SEAMEO BIOTROP. The training course started with opening ceremony.

In the opening ceremony, the Director of SEAMEO BIOTROP (Dr. Handoko) delivered his remark, followed by the remark of the Program Coordinator of UNIDO representative Jakarta (Mr. Nahrudin Alie). The Director of Human Resources and General of Perum BULOG (Mr. Agus Syaifullah, MSc.) attended the training and delivered his address. Mrs. Tri Widayati, MT. represented Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment, delivered her remark and also officially declared open the training.

During the opening ceremony a symbolic transfer of phosphine fumigation and ISPM equipments grant from UNIDO through Ministry of Environment to beneficiaries has also been conducted. Mr. Agus Saifullah, MSc. represented the participants of Perum BULOG to receive phosphine fumigation equipments, while Mr. Imron Tengriano from PT Eastern Pearl Flour Mills represented for participants who received ISPM equipment. The list of grant equipments of phosphine fumigation and ISPM is presented in Appendix 4. The lists of recipients of grant equipments are presented in Appendices 5 and 6.

After the opening session of the Training Course, the activity was started with a pre-test. The participants should answer a pre-test form which contained questions related to fumigant and fumigation. The purpose of this pre-test was to get information on the knowledge of the participants in relation with the subject of the training. The activity was continued with lecture on phosphine fumigation good practices, delivered by Dr. Hariyadi Halid (Perum BULOG). The lecture on the use of phosphine meter and phosphine calibrator was delivered by Mr. Rahul Singh (United Phosphorus Limited, India). Lecture on the use of fumigation safety equipments (full face mask and filter canister) was delivered by Mr. Teja Sukmana (PT Berkas Niaga Dunia). After the last subject of the training, Mrs. Endang Pratiwi (Ministry of Environment) explained about monitoring and evaluation of the grant equipments after they have been transferred to the beneficiaries. The monitoring and evaluation will be conducted at the beneficiaries institutions or companies.

The activities for the second day of the training was held at Darmaga New Warehouse of Perum BULOG Sub Divre Cianjur Divre West Java to conduct real fumigation and the use of phosphine meter. Before participants used phosphine meter, they conducted calibration of their equipments with the guidance of Mr. Rahul Singh.

The use of ISPM equipments has also been demonstrated to the participants by Mr. Ade Syaefurrohman from PT Berdikari and Mrs. Sri Widayanti from SEAMEO BIOTROP.

After the practical on phosphine fumigation, participants was given post test to get information about their knowledge after following this training course. After post test, the training course was officially closed.

During the closing ceremony a report was delivered by Dr. Okky Setyawati Dharmaputra as the training coordinator. In her report she mentioned about the success of the 2nd Training Course on Phosphine Fumigation Good Practices and the Use of Phosphine Fumigation Equipments. The success of the training could be concluded from the results of pre- and post test of the participants. The posttest showed a quite significant increase of result (value) which means that the participants knowledge on the subjects have been improved. At

the closing ceremony a remark was also delivered by the National Project Coordinator (Dr. Purnama Hidayat) who officially closed the training.

**LIST OF PARTICIPANTS AND OBSERVERS OF
THE 2nd TRAINING COURSE OF PHOSPHINE FUMIGATION GOOD PRACTICES
AND THE USE OF PHOSPHINE FUMIGATION EQUIPMENTS
SEAMEO BIOTROP, Bogor, 13 - 14 August 2007**

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**LIST OF LECTURERS AND INSTRUCTORS OF
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AND THE USE OF PHOSPHINE FUMIGATION EQUIPMENTS
SEAMEO BIOTROP, Bogor, 13 - 14 August 2007**

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4.3. TRAINING OF TRAINERS ON INTEGRATED STORAGE PEST MANAGEMENT

Training of Trainers on Integrated Storage Pest Management was held at SEAMEO BIOTROP, Bogor, on 24 - 28 April 2006.

The objectives of the training were to provide the understanding and practice on the techniques of integrated storage pest management. It is hoped that in their home region the participants could share their knowledge gained in this training to other staff members in their respective institutions as well as to other parties involved in storage pest management.

There were 10 participants coming from food industries and related institutions such as Perum BULOG, Plant Quarantine Service and Ministry of Environment. The lecturers of this training were recruited from the Ministry of Environment, NPC, Department of Plant Protection,

Bogor Agricultural University; Perum BULOG and SEAMEO BIOTROP. The list of participants and lecturers are presented in Appendix 1.

The subjects prepared for the training were in the form of module and manual on Integrated Storage Pest Management. Those two books were given to the participants at the time of registration. Aside from that, the modules and manuals of the Training Course on Phosphine Fumigatin Good Practices were also distributed to the participants. Perum BULOG provided the participants with a manual on "Monitoring the Quality and Level of Pest Infestation" and also a manual on Procedures of Inspection the Quality of Paddy, Milled Rice and Polypropylene Bags at Perum BULOG".

All activities of the training were conducted at SEAMEO BIOTROP, rice storage of Perum BULOG at Darmaga, Bogor; Paddy and Milled Rice Processing Unit, new BULOG storage at Sukabumi, Subdivre Cianjur, Divre West Java.

The opening of the training was conducted after the registration of participants. At the opening ceremony Dr. Okky Setyawati Dharmaputra as the training coordinator delivered her report on the conduct of the training, remarks by UNIDO representative in Jakarta (Mr. Masayoshi Matsushita) and the Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment represented by Mrs. Wahyu Indraningsih, Assistant Deputy for Coastal and Marine Destruction Control. Hence, the training was officially declared open by Dr. Handoko, Director of SEAMEO BIOTROP.

All the activities of the training were conducted at SEAMEO-BIOTROP, while for practical works also conducted at the rice storage of Perum BULOG Subdivre Cianjur, Divre West Java located at Darmaga, Bogor; and Paddy and Milled Rice Processing Unit, new BULOG storage at Sukabumi, Subdivre Cianjur, Divre West Java.

At the beginning of the training, all the participants of the training should answer evaluation form containing questions on ozon layer, storage pests and integrated storage pests management. The result of the evaluation is used as an indicator on the capability/knowledge of the participants prior to attending the training. At the end of the training course the participants were also requested to answer an evaluation form to find out whether their knowledge/capability has improved. In addition, at the end of the training a set of questions (printed as evaluation forms) were given to the participants to obtain information on their evaluation on the quality of the training. Subjects evaluated include academic aspect, field practical, services and facilities.

On the last day of the training, the participants presented their group assignments on the integrated food commodity management and individual assignment on implementation plan, monitoring and regional training on Integrated Storage Pest Management to be carried out in their respective institutions. The group assignments were divided into 3 groups. Group I : Mrs. Husnul Khatimah Ramli, Mr. Syamsul Rijal and Mrs. Siti Mardati Saing; Group II : Mr. Teguh Setia Nugraha, Ms. Ati Sukmiati and Mr. Abi Said Hudry; and Group III : Mr. Eri S. Rilwan, Ms. Wulan Eka Putri and Mr. Fasika Khaerul Zaman.

The training was terminated with a closing ceremony. At the closing ceremony Dr. Okky Setyawati Dharmaputra as training coordinator presented her report on the result of the training. In her report she mentioned about the success of the training based on the final evaluation which showed a significant increase of knowledge improvement of the subjects compared to the result of evaluation made at the beginning of the training. Mrs. Sulistyowati, MM, Assistant Deputy for Climate Change Impact Control delivered her remarks. In her remarks she expressed her grateful appreciation to SEAMEO BIOTROP for having successfully conducted the Training for Trainers on Integrated Storage Pest Management. Hence, the training was officially closed by Mr. Ith Vuthy, MSc, MA on behalf of the Director of SEAMEO BIOTROP.

The program of the Training for Trainers on Integrated Storage Pest Management is presented as Appendix 2.

Generally, the participants proposed that the number of participating institutions should be broadened in order to establish a solid network and communication which will support each other to solve problems that encounter in the field in implementing integrated storage pest management. The participants also suggested that monitoring in their respective institutions should be done in order to know whether the integrated storage pest management activities have been implemented optimally.

The implementation of integrated storage pest management by the participants of the training in their respective institutions were monitored . The monitoring was done in September -Desember 2006.

After the monitoring, the participants also conducted Regional Training Courses on Integrated Storage Pest Management in their respective regions. The Regional Training has been done on November 2006 to June 2007.

**LIST OF PARTICIPANTS AND LECTURERS OF
THE TRAINING OF TRAINERS ON INTEGRATED STORAGE PEST MANAGEMENT
SEAMEO BIOTROP, Bogor, 24 – 28 April 2006**

LIST OF PARTICIPANTS

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PROGRAM ON THE TRAINING OF TRAINERS ON INTEGRATED STORAGE PEST MANAGEMENT
SEAMEO BIOTROP, Bogor, 24-28 April 2006

Day/Date/Time	Program	Lectuer
Monday 24 April 2006		
08.00 – 09.00	Registration of Participants	
09.00 – 09.30	Opening Ceremony:	
	- Report by Training Coordinator	Dr. Okky Setyawati Dharmaputra
	- Address by UNIDO Representative Jakarta	Mr. Masayoshi Matsushita
	- Address by the Ministry of Environment	Mrs. Wahyu Indraningsih
	- Address by SEAMEO BIOTROP Director and Opening of the Training	Dr. Handoko
09.30 – 10.00	COFFEE/TEA BREAK	
10.00 – 10.45	Early evaluation of the training	Organizing Committee
10.45 – 12.00	Strategy and the program of ozone layer protection in Indonesia (Lecture)	Mrs. Tri Widayati, MT.
12.00 – 13.00	LUNCH	
13.00 – 14.00	Towards the phase-out on the use of methyl bromide in grain storage in Indonesia (Lecture)	Dr. Purnama Hidayat
14.00 – 14.30	COFFEE/TEA BREAK	
14.30 – 16.30	Integrated Storage Pest Management (Lecture)	Dr. Purnama Hidayat
Tuesday, 25 April 2006		
08.30 – 10.00	Introduction to storage insect pest (Lecture)	Mr. Sunjaya
10.00 – 10.30	COFFEE/TEA BREAK	
10.30 – 12.00	Introduction to storage insect pest (Practical work)	Mr. Sunjaya Mrs. Sri Widayanti

12.00 – 13.00	LUNCH	
13.00 – 15.00	Ecology of storage insect pest (Lecture)	Dr. Idham S. Harahap
15.30 – 15.45	COFFEE/TEA BREAK	
15.45 – 17.00	Storage fungi in grains (Lecture)	Dr. Okky S. Dharmaputra
Wednesday, 26 April 2006		
07.00 – 08.00	Departure to practicals work location (milled rice storage Perum BULOG Dramaga, Sub Divre Cianjur, Divre West Java)	
08.00 – 10.00	Monitoring of storage insect pest (Lecture and practical work)	Dr. Idham Sakti Harahap Dr. Dadang Mr. Sunjaya Mrs. Sri Widayanti
10.00 – 10.15	COFFEE/TEA BREAK	
10.15 – 12.00	Sampling technique for commodities (Lecture) and quality analysis (Practical work)	Dr. Hariyadi Halid Mr. Syamsuddin DM
12.00 – 13.00	LUNCH	
13.00 – 14.30	Quality analysis (Practical work: continuation)	Mr. Syamsuddin DM
14.30 – 16.30	Integrated management of food commodities (Practical work)	Dr. Hariyadi Halid
16.30 –	Back to SEAMEO BIOTROP	
Thursday, 27 April 2006		
08.00 – 10.00	Storage pest control using pesticides (Lecture and practical work)	Mr. Djoko Prijono, MAgr.
10.00 – 10.15	COFFEE/TEA BREAK	
10.15 – 12.00	Departure to practical work location Sukabumi (Processing Unit for Paddy and Milled Rice, New BULOG Storage, Perum BULOG Sukabumi, Sub Divre Cianjur, Divre West Java)	
12.00 – 13.00	LUNCH	
13.00 – 15.30	Rice milling process at Processing Unit for Paddy and Rice, New BULOG Storage Sukabumi, Perum BULOG Sukabumi, Sub Divre Cianjur, Divre West Java and business partner (Lecture) and integrated food commodity management (Practical work)	Mr. Syamsuddin DM Dr. Purnama Hidayat Dr. Hariyadi Halid
15.30 – 15.45	COFFEE/TEA BREAK	
15.45 –	Back to SEAMEO BIOTROP	
Friday, 28 April 2006		
08.00 – 10.00	Report writing : group assignment for program preparation on Integrated Storage Pest Management	Dr. Okky S. Dharmaputra Mr. Sunjaya Mrs. Sri Widayanti
10.00 – 10.15	COFFEE/TEA BREAK	
10.15 – 11.30	Presentation by each group assigned to prepare program on Integrated Storage Pest Management	Dr. Okky S. Dharmaputra Dr. Purnama Hidayat Mr. Sunjaya Mrs. Sri Widayanti
11.30 – 13.30	Friday Prayer and Lunch	
13.30 – 14.00	Final Evaluation of the Training	Organizing Committee
14.00 – 15.00	Individual presentation on program implementation, monitoring and regional training on Integrated Storage Pest Management	Dr. Okky S. Dharmaputra Dr. Purnama Hidayat Mr. Sunjaya Mrs. Sri Widayanti
15.00 – 15.30	Discussion on technical implementation, monitoring and regional training on Integrated Storage Pest Management	Dr. Okky S. Dharmaputra Dr. Purnama Hidayat Mr. Sunjaya Mrs. Sri Widayanti
15.30 – 15.45	COFFEE/TEA BREAK	
15.45 – 16.15	Closing Ceremony	

4.4. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT

The Regional Training Course on Integrated Storage Pest Management is an implementation of the follow up of the Training of Trainers on Integrated Storage Pest Management conducted at SEAMEO BIOTROP from 24 to 28 April 2006. The participants of the Training for Trainers on Integrated Storage Pest Management have the obligation to transfer their knowledge obtained during the training to the other staff of their work places as well as to other personnel in their region who are responsible for storage pest management.

The objectives of the training were to disseminate the knowledge and technology of integrated storage pest management in the respective areas of the participants, as an alternative technology to replace the use of methyl bromide in grain storages.

1. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT FOR PERUM BULOG DIVRE DKI JAKARTA AND DIVRE WEST JAVA

The training was held at SEAMEO BIOTROP, Bogor, from 21 to 23 November 2006. The program of the training is presented in Table.

The participants for the region of Perum BULOG Divre DKI Jakarta consisted of 10 with the breakdown as follows : 9 participants from Perum BULOG and one participant from the business partner of Perum BULOG (Appendix 2). The participants for Perum BULOG Divre West Java consisted of 13 coming from Perum BULOG (10) and the business partners of Perum BULOG (3) (Appendix 3). This is the first Regional Training Course on Integrated Storage Pest Management conducted.

Considering the importance of ISPM in minimizing the cost expended for storage pest control, Perum BULOG is very interested in this kind of training. Therefore, the conduct of the Regional Training on ISPM for the region of Perum BULOG DKI Jakarta has been joined with the Perum BULOG Divre West Java and also with the Education and Training for Quality Maintenance of Perum BULOG (*Diklat Perawatan Kualitas Perum BULOG*). The participants of the Education and Training for Quality Maintenance Perum BULOG consisted of 34. Thus, the total participants became 58. This is a good response because originally the training was only planned to be attended by 10 participants for each region, but in this training, with the

cooperation of Perum BULOG, the total participants of the two regions which should be 20 became 58. This means that making the ball rolling has a significant effect on the dissemination of information and technology on integrated storage pest management which is an alternative technology to replace the use of methyl bromide in grain storages in Indonesia.

The lecturers of this training were the participants of the Training for Trainers of ISPM from Perum BULOG Divre DKI Jakarta and Divre West Java assisted by lecturers from the Ministry of Environment, National Project Coordinator (NPC), SEAMEO BIOTROP and Perum BULOG.

The materials for this course are similar with the materials given to the participants of the Training for Trainers on Integrated Storage Pest Management. Therefore the participants were given the modules and manuals of Integrated Storage Pest Management as well as Phosphine Fumigation Good Practices.

The training was conducted for three days from 21 to 23 November 2006. On the first day, the activities of the training was carried out at SEAMEO BIOTROP, Bogor in the form of lectures and practical work, while on the second and third day practical work were given at the milled rice warehouse of Perum BULOG Karang Tengah, Sub Divre Cianjur, Divre West Java.

The opening of the training took place after the registration of participants. At the opening program of the training, addresses were delivered by the Head of Education and Training Program of Perum BULOG (Ir. Eddy Rizal, MBA, MSc.), followed by addresses from the Representative of UNIDO Jakarta (Mr. Nahrudin Alie), the Director of SEAMEO BIOTROP (Dr. Handoko), and hence followed by the address of Assistant Deputy for Climate Change Impact Control, Ministry of Environment (Mrs. Sulistyowati, MM) who officially declared open the training.

Lecture activities were conducted at SEAMEO BIOTROP, while practical work were carried out aside from SEAMEO BIOTROP, also at the milled rice warehouse of Perum BULOG of Karang Tengah, Sub Divre Cianjur, Divre West Java.

The practical work activities which got serious attention were preparing, installing and collecting of data from various insect traps i.e. carton trap, bait trap, sticky trap, and also light trap. This was due to the use of various insect traps to determine the population of storage insect pests which was a new technique for staff members of Perum BULOG. Participants were very enthusiastic because of the superiority in the use of these insect traps to determine the storage insect pest population which does not require sampling of rice. To know the storage insect population, usually sampling of milled rice as much as 1 kg for every sample bag. The

participants expected that the monitoring technique for pest using insect traps could be adopted and implemented at Perum BULOG circle. Nevertheless, this technique has its weaknesses i.e. there is no correlation data between the determined population based on catch and level of damage caused. Further researches are still needed.

The training course was ended with the closing ceremony held at the milled rice warehouse of Perum BULOG Karang Tengah, Sub Divre Cianjur, Divre West Java. The Training Course was officially closed by the Assistant Deputy for Climate Change Impact Control, Ministry of Environment (Mrs. Sulistyowati, MM).

**PROGRAM OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT
FOR PERUM BULOG DIVRE DKI JAKARTA AND DIVRE WEST JAVA
SEAMEO BIOTROP, Bogor, 21 – 23 November 2006**

Day/Date/Time	Program	Lecturer
Tuesday, 21 November 2006		
08.00 – 08.30	Registration of Participants	
	Opening Ceremony :	
	- Address by Perum BULOG	Mr. Eddy Rizal, MBA., MSc.
	- Address by UNIDO Representative, Jakarta	Mr. Nahrudin Alie
	- Address by SEAMEO BIOTROP	Dr. Handoko
	- Address by the Ministry of Environment and Opening of the Training	Mrs. Sulistyowati, MM.
08.30 – 09.45	Strategy and Program on Protection of Ozone Layer in Indonesia (Theory)	Mrs. Sulistyowati, MM.
09.45 – 10.00	Break	
10.00 – 11.00	Introduction to Integrated Storage Pest Management (Theory)	Dr. Purnama Hidayat (IPB)
11.00 – 12.30	Implementation of Integrated Storage Pest Management (Including Storage Pest Control) (Theory)	Dr. Haryadi Halid
(10.00 – 12.30)	Integrated Storage Pest Management (Theory)	1. Mrs. Husnul Chotimah 2. Ms. Ati Sukmiati
12.30 – 13.15	Break/Lunch	
13.15 – 15.15	Introduction to Storage Insect Pest (Theory and Practical Work)	1. Dr. Haryadi Halid 2. Mr. Sunjaya (SEAMEO BIOTROP) 3. Mrs. Sri Widayanti (SEAMEO BIOTROP) 4. Mr. Teguh M. Sarjono, MSc.
15.15 – 15.30	Break	
15.30 – 17.30	Storage Fungi of Grain (Theory and Practical Work)	1. Dr. Okky S. Dharmaputra (SEAMEO BIOTROP) 2. Mrs. Ina Retnowati (SEAMEO BIOTROP)
17.30	Leaving for Cianjur	

Day/Date/Time	Program	Lecturer
Wednesday, 22 November 2006		
06.00 – 08.00	Leaving for GBB Karang Tengah	
08.00 – 08.30	Welcome address by – Divre/Pusdiklat	
08.30 – 10.00	Monitoring of Storage Insect Pest and Inspection of Integrated Storage Pest Management (Theory and Practical Work)	Responsible for Field Practical (PKL): Kapusdiklat Coordinator : Mitfa Roswita (Perum Bulog) Sri Widayanti (SEAMEO BIOTROP) Endang Pratiwi (KLH) Subjects Coordinator of PKL: Teguh Sarjono, MSc.
10.00 – 10.15	BREAK	
10.15 – 11.15	Preparation and installing of Insect Traps (Theory and Practical Work)	
11.15 – 12.15	Spraying (Theory and Practical Work)	Supervisor for Group A : - Yun Cahyana N, MBA. - Sunjaya - Suherman Assistance : - Samsuddin DS. Staff in charge : - Neni Yuliantini - Suratman
12.15 – 13.00	BREAK / LUNCH	
13.00 – 14.00	Continuation (Spraying)	Supervisor Group B: - Teguh Sarjono, MSc. - Husnul Chotimah - Dr. Purnama Hidayat Assistance : - Titiek Permani - Kennedy F.S. - Hastuti H.
14.00 – 15.45	Fumigation (opening and folding plastic sheet) (Theory and Practical Work)	
15.45 – 17.00	BREAK AND DISCUSSION	
17.00 – 18.00	Back to dormitory	
18.00 – 19.00	BREAK / DINNER	
19.00 – 21.00	Administration and Liquidation, Activities on Quality Maintenance	

Day/Date/Time	Program	Lecturer
Thursday, 23 November 2006		
06.00 – 08.00	Leaving for GBB Karang Tengah	
08.30 – 09.15	Sampling Method /Milled Rice/Unhulled Rice Sample (Theory and Practical Work)	Responsible for field practical work : Kapusdiklat Coordinator: Mitfa Roswita

		(Perum Bulog) Sri Widayanti (SEAMEO BIOTROP) Endang (KLH) Subjects Coordinator of PKL: Teguh Sarjono, MSc.
09.15 – 10.00	Observation of trapped insects (Practical Work)	
10.00 – 10.15	BREAK	
10.15 – 12.15	Fumigation (Covering stack using plastic sheet)	Supervisor for group A : - Yun Cahyana N, MBA. - Sunjaya Assistance: - Samsuddin DS. Staff in charge : - Neni Yuliantini - Suratman
12.15 – 13.00	BREAK / LUCNH	
13.00 – 14.15	Continuation / Concluded with discussion and closing	Supervisor for group B: - Teguh Sarjono, MSc. - Husnul Chotimah Assistance : - Titiek Permani - Kennedy F.S. - Hastuti H.

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR PERUM BULOG DIVRE DKI JAKARTA
SEAMEO BIOTROP, Bogor, 21 – 23 November 2006**

No	Name	Institution
1	Cory Trisilawaty	Perum BULOG
2	Rachman Sugianto	Perum BULOG
3	Seymour Magabe	Perum BULOG
4	Nurman Susilo	Perum BULOG
5	Mochamad Gelar Hidayat	Perum BULOG
6	Novi Ardiani	Perum BULOG
7	Cahyaningtyas Rispinatri	Perum BULOG
8	Sofyan Abdullah	Perum BULOG
9	Munawar	Perum BULOG
10	H. Ridwan	Business Partner of Perum BULOG

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR PERUM BULOG DIVRE WEST JAVA
SEAMEO BIOTROP, Bogor, 21 – 23 November 2006**

No	Name	Institution
1	Abdul Gani	Perum BULOG
2	Agus Hermawan	Perum BULOG
3	Agustina Uli Siregar	Perum BULOG
4	Asep Badar Daelar	Perum BULOG
5	Cucu Jayadipura	Perum BULOG
6	Damianus Subagyo	Perum BULOG
7	Sumarna Muharip	Perum BULOG
8	Toto Rochana MP.	Perum BULOG

9	Udju hasan Anadin	Perum BULOG
10	Yoyo Sunaryo	Perum BULOG
11	Nolly Dessyanty	Perum BULOG
12	Apep Suryana	Perum BULOG
13	Ade Rohmat H.	Business Partner of Perum BULOG
14	M.T. Ridwan	Business Partner of Perum BULOG

2. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT (ISPM) FOR CENTRAL JAVA REGION

In this training course SEAMEO BIOTROP also collaborated with PT Garudafood Putra-Putri Jaya Coated Peanuts Pati, Central Java. In this case, PT Garudafood provided a lecture room and a warehouse for practical work. This is the second Regional Training Course on ISPM.

The training was held at PT Garudafood Putra-Putri Jaya Coated Peanuts Pati, Central Java, from 4 to 5 January 2007.

The participants consisted of 13 with the breakdown as follows : one participant from PT Sriboga Ratu Raya (flour mills company), 4 participants from PT Garudafood Putra Putri Jaya Coated Peanuts Division Pati, -3 participants from PT Garudafood Putra Putri Jaya Roasted Peanuts Division Pati, one participant from Perum BULOG Divre Central Java, one participant from Plant Quarantine Agency (*Balai Karantina Tumbuhan Kelas I Tanjung Emas Semarang*), one participant from the Indonesian Government's Regional Office of Agricultural Crop and Animal Husbandary in Pati (*Dinas Pertanian dan Peternakan Kabupaten Pati*), one participant from UD Mutiara (the business partner of PT Garudafood) and one participant from PT Rentokil (pest control company) (Appendix 1).

The lecturers of this training were a participant of the Training for Trainers of ISPM from PT Garudafood (Ms. Wulan Eka Putri), assisted by lecturers from the Ministry of Environment (Mrs. Endang Pratiwi), National Project Coordinator (NPC) (Dr. Purnama Hidayat), SEAMEO BIOTROP (Dr. Okky Setyawati Dharmaputra, Mr. Sunjaya and Mrs. Sri Widayanti).

The materials for this course were similar with the materials given to the participants of the Training for Trainers on Integrated Storage Pest Management. Therefore the participants

were given the modules and manuals of Integrated Storage Pest Management as well as Phosphine Fumigation Good Practices. The program of the training is presented in Table.

The opening of the training took place after the registration of participants. At the opening program of the training, an address was delivered by the Plant Manager of PT Garudafood Putra Putri Jaya Coated Peanuts Division Pati (Mr. Bambang Lukito) who officially declared open the training. Addresses were also delivered by the Director of SEAMEO BIOTROP (represented by Dr. Okky Setyawati Dharmaputra) and Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment (represented by Mrs. Endang Pratiwi).

At the beginning of the training, all the participants of the training should answer an evaluation form containing question on storage pest and integrated storage pests management. The result of the evaluation is used as an indicator on the capability/knowledge of the participants prior to attend the training. At the end of the training course the participants were also requested to answer an evaluation form to find out whether their knowledge/capability has been improved.

The topics of the lectures were 1) Strategy and the program of ozone layer protection in Indonesia, 2) Towards the phase-out of the use of methyl bromide in grain storage in Indonesia, 3) Integrated storage pest management, 4) Introduction to storage insect pest, and 5) Storage Mould in grains. Ms. Wulan Eka Putri, a staff at PT Garudafood gave a lecture on Integrated Storage Pest management. The topics of the practical works were 1) Monitoring and evaluation of storage insect pest using various insect traps (carton trap, bait trap, and sticky trap) and 2) Demonstration of phosphine fumigation good practices.

The activities of the training was carried out at PT Garudafood Putra Putri Jaya Coated Peanuts Division Pati in the form of lectures and practical work. Practical work was given at the warehouse of PT Garudafood Putra Putri Jaya Coated Peanuts Division Pati. The warehouse stores raw materials (onion, garlic, salt, sugar, tapioca, etc) to prepare flour-coated peanuts.

The practical work activities which got serious attention were installing and collecting of data from various insect traps i.e. carton trap, bait trap, and sticky trap. This was due to the use of various insect trap to determine the population of storage insect pests which was a new technique for participants. As the warehouse of PT Garudafood is relatively clean, therefore not much insects were trapped. Nevertheless, by using carton trap, some insects were trapped. Participants were also very enthusiastic to improve their knowledge and skill in demonstration of phosphine fumigation good practices on a stack containing tapioca. The

demonstration was delivered by Mr. Sulkify, a staff of PT Agricon Putra Cipta Optima (Terminix).

The training was terminated with a closing ceremony. At the closing ceremony Dr. Okky Setyawati Dharmaputra presented her report on the result of the training. In her report she mentioned about the increase of the result (value) which means the participants knowledge on the subject have been improved. General discussion was carried out prior to the closing ceremony. Some suggestions were given by the participants. Hence, the training was officially closed by Production Manager of PT Garudafood Putra Putri Jaya Coated Peanuts Division Pati (Mr. Abdul Karim).

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR CENTRAL JAWA REGION**
Pati, 4 - 5 January 2007

No	Name	Institution
1	Subiyanto, SE	Balai Karantina Tumbuhan Kelas I Tanjung Emas Jl. Benoa No 1, Pelabuhan Tanjung Emas, Semarang, telp. : 024 3540940, fax : 024 3542813, HP : 081559599577
2	Purnadi, SP. MM.	Dinas Pertanian dan Peternakan Kabupaten Pati Jl. Diponegoro 23, Pati, telp.: 0295 381418, fax : 0295 381087
3	Lilik Nugroho	PT Sriboga Raturaya (Quality Assurance, Asst. Manager) Jl. Deli No. 10 Tanjung Emas, Semarang, 50174, telp.: 024 3558373, Fax : 024 3553800, HP : 081575111576, e-mail: lilik@sriboga-smg.co.id
4	Joko Tri Septanto, SH. MM.	Perum BULOG Divre Jateng (Regional Manager Ujastasma) Jl. Menteri Supeno III, Semarang, telp.: 024 8412290, fax : 024 8412369, HP : 08164244238
5	Farid Yuzki	PT Garudafood Putra Putri Jaya Coated Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 081325219084
6	Anggraeni	PT Garudafood Putra Putri Jaya Roasted Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 081325184988, e-mail : anggraeni@garudafood.co.id, eenanggraeni@yahoo.com
7	Sarwono Pambudi	PT Rentokil Indonesia Jl. Kawi Raya 39 A Semarang, HP : 081325035900, 08882554788
8	Nawi	UD Mutiara Jl. Raya Tuban Babat Km 5 Tuban, telp : 0354 322954
9	Harjo	PT Garudafood Putra Putri Jaya Coated Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 08886596506
10	Imam Cahyono	PT Garudafood Putra Putri Jaya Coated Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 08886596510
11	Priyo Suprptono	PT Garudafood Putra Putri Jaya Roasted Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 08886596563

12	Nunung Erni Relawati	PT Garudafood Putra Putri Jaya Roasted Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 08882808785
13	Wagiran	PT Garudafood Putra Putri Jaya Roasted Pati Jl. Raya Pati Juwana No 2,3 Pati, telp.: 0295 381673, fax : 0295 383863, HP : 081390250331

**PROGRAM OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT
FOR CENTRAL JAWA REGION
Pati, 4 - 5 January 2007**

Day/Date/Time	Program	Lecturer
Thursday, 4 January 2007		
08.00 – 08.15	Registration of Participants	
08.15 – 08.45	Opening Ceremony :	
	- Address by Plant Manager PT Garudafood and Opening of the Training	Mr. Bambang Lukito
	- Address by SEAMEO BIOTROP	Dr. Okky Setyawati Dharmaputra
	- Address by Ministry of Environment	Mrs. Endang Pratiwi
08.45 – 09.00	Pre Evaluation	Committee
09.00 – 10.00	- Strategy and the Program of Ozone Layer Protection in Indonesia - Towards the Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia	Mrs. Endang Pratiwi Dr. Purnama Hidayat
10.00 – 10.15	Break	
10.15 – 11.30	Introduction to Storage Insect Pest	Mr. Sunjaya Mrs. Sri Widayanti
11.30 – 12.00	Introduction to Integrated Storage Pest Management (ISPM)	Dr. Purnama Hidayat
12.00 – 13.00	Lunch	
13.00 – 14.00	Integrated Storage Pest Management	Ms. Wulan Eka Putri
14.00 – 15.30	Storage Mould in Grains	Dr. Okky Setyawati Dharmaputra
15.30 – 16.00	Break	
16.00 – 17.00	Installing Insect Traps	Mr. Sunjaya Mrs. Sri Widayanti
Friday, 5 January 2007		
08.00 – 09.00	Monitoring and Evaluation of Data Collected from Various Insect Traps	Dr. Purnama Hidayat Mr. Sunjaya Mrs. Sri Widayanti
09.00 – 11.00	Phosphine Fumigation Good Practices.	Sulkify (PT Agricon Putera Citra Optima (Terminix))
11.00 – 11.30	Break	
11.30 – 13.00	Friday Prayer and Lunch	
13.00 – 13.15	Post Evaluation	Committee
13.15 – 14.30	General Discussion	Dr. Purnama Hidayat
14.30 – 15.30	Closing Ceremony	

3. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT (ISPM) FOR EAST JAVA AND EAST KALIMANTAN REGIONS

In this training course SEAMEO BIOTROP also collaborated with Perum BULOG. In this case, Perum BULOG provided a lecture room and a warehouse for practical work. This is the third Regional Training Course on ISPM.

The training was held at Hotel Utami and Buduran warehouse complex Perum BULOG Divre East Java in Sidoarjo, from 28 to 30 March 2007.

Considering the importance of ISPM in minimizing the cost expended for storage pest control, Perum BULOG is very interested in this kind of training. Therefore, the conduct of the Regional Training on ISPM for the region of Perum BULOG Divre East Java has been joined with the Perum BULOG Divre East Kalimantan, also with the Education and Training for Quality Maintenance and Warehousing of Perum BULOG.

The participants of Regional Training Course of ISPM consisted of 23 (Appendix 1) with the breakdown as follows : 16 participants from Perum BULOG Divre East Java, 5 participants from Perum BULOG Divre East Kalimantan, one participant from Plant Quarantine Station (Balai Besar Karantina Tumbuhan Tanjung Perak, Surabaya), and one participant from PT JAPFA COMFEED INDONESIA Tbk., Sidoarjo (feedmill factory). The participants of the Education and Training for Quality Maintenance Perum BULOG consisted of 13 participants, and for Warehousing 11 participants. Thus, the total participants became 47. This is a good response because originally the training was only planned to be attended by 10 participants for each region, but in this training, with the cooperation of Perum BULOG, the total participants of the two regions which should be 20 became 47. This means that making the ball rolling has a significant effect on the dissemination of information and technology on integrated storage pest management which is an alternative technology to replace the use of methyl bromide in grain storages in Indonesia.

In fact, the lecturers of this training should be the participants of the Training for Trainers of ISPM from Perum BULOG Divre East Java and Divre East Kalimantan, but only a participant from Perum BULOG Divre East Java gave a lecture assisted by lecturers from the

Ministry of Environment, National Project Coordinator (NPC), SEAMEO BIOTROP and other Perum BULOG staffs.

The materials for this course were similar with the materials given to the participants of the Training for Trainers on Integrated Storage Pest Management. Therefore the participants were given the modules and manuals of Integrated Storage Pest Management as well as Phosphine Fumigation Good Practices. The program of the training is presented in Table..

The opening of the training took place after the registration of participants. At the opening program of the training, an address was delivered by the Director of SEAMEO BIOTROP (represented by Dr. Okky Setyawati Dharmaputra), followed by addresses from Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment (represented by Mrs. Kusmulyani, MS.) and Deputy Head of Perum BULOG Divre East Java (Mrs. Kiki Partini, MSc) who officially declared open the training.

On the first day, the activity of the training was carried out at Hotel Utami, Sidoarjo, in the form of lectures and practical work, while on the second and third days practical field work (PKL) they were given at the milled rice warehouse of Perum BULOG GBB Buduran II, Sub Divre North Surabaya, Divre East Java.

At the beginning of the training, all the participants of the training should answer an evaluation from containing questions on ODS, storage pest and integrated storage pests management. The result of the evaluation is used as an indicator on the capability/knowledge of the participants prior to attend the training. At the end of the training course the participants were also requested to answer an evaluation form to find out whether their knowledge/capability has been improved.

The lecture was started with Strategy and the Program of Ozone Layer Protection in Indonesia, delivered by Mrs. Kusmulyani, MS., from Ministry of Environment. Mr. Teguh Setia Nugraha, a staff of Perum BULOG Divre East Java gave a lecture on Integrated Storage Pest Management, accompanied by Dr. Purnama Hidayat. Lecture and practical work on Storage Insect Pest were given by Mr. Sunjaya, assisted by Mrs. Sri Widayanti. Various species of storage insect pest were introduced to the participants. It is expected that the participants will be able to identify storage insect pest easily, also they will know how to monitor and to control the insects. The following lecture was Storage Mould in Grain, given by Dr. Okky Setyawati Dharmaputra. This topic of lecture was useful for the participants, because mould is the second important pest of stored grain after insect. The participants were interested in observing various species of mould infecting stored peanuts.

In the field practical work (PKL) activity, subject matters in relation with milled rice quality maintenance, insect monitoring, phosphine fumigation, and spraying using insecticide were also given to the participants.

The practical work activities which got serious attention were preparing, installing and collecting of data from various insect traps i.e. carton trap, bait trap, sticky trap, and also light trap. This was due to the use of various insect traps to determine the population of storage insect pests which was a new technique for staff members of Perum BULOG. Participants were very enthusiastic because of the superiority in the use of these insect traps to determine the storage insect pest population which does not require sampling of rice. Especially for light trap, it has more advantage in trapping moth which could not be trapped by another traps (carton, sticky and bait trap). The use of light trap is useful to support the policy of Perum BULOG, among others their warehouses should be free from *Ephestia*. To know the storage insect population, usually sampling of milled rice as much as 1 kg for every sample bag using a probe (a spear sampler). The participants expected that the monitoring technique for pest using insect traps could be adopted and implemented at Perum BULOG circle. Nevertheless, this technique has its weaknesses i.e. there is no correlation data between the determined and real population. Further researches are still needed.

The training course was ended with the closing ceremony held at the office of milled rice warehouse complex of Perum BULOG (GBB = *Gudang BULOG Baru*) Buduran II, Sub Divre Surabaya Utara, Divre East Java. At the closing program of the training, Mrs. Sri Widayanti presented her report on the result of evaluation. In her report she mentioned about the increase of the result (value) which means the participants knowledge on the subject have been improved. The Head of Subdivre Perum BULOG North Surabaya (Mr. Tomy Christanto, MM.) delivered his address, and hence followed by the address from Ministry of Environment (represented by Dr. Purnama Hidayat) who officially closed the training.

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR EAST JAVA AND EAST KALIMANTAN REGIONS**
Hotel Utami, Sidoarjo, 28 – 30 March 2007

No	Name	Institution
1	Drs. Ariston Setiawan	Kepala Seksi Perawatan Kualitas Divre Kaltim PERUM BULOG
2	Mardi Harianto	Kepala Gudang Gudang Khusus Divre Kaltim PERUM BULOG
3	Eko Purwanto	Kepala Gudang GBM Buduran 2 (A1) Subdivre Wil I Surabaya Utara Divre Jatim PERUM BULOG
4	Muhammad Soleh	Staf Kerani GBB Samarinda (A2) Subdivre Wil I Samarinda Divre Kaltim PERUM BULOG
5	Sukadi	Kepala Gudang GDT Bulungan (B) Subdivre Wil II Tarakan Divre Kaltim PERUM BULOG
6	Suharsana	Kepala Gudang GSP Tanjung Redap (B) Subdivre Wil II Tarakan Divre Kaltim PERUM BULOG
7	Totok Harisusanto	Kepala Gudang GBB Mojongampit (A2) Subdivre Wil II Surabaya Selatan Divre Jatim PERUM BULOG
8	Sigit Suryatno, BC.AK.	Kepala Gudang GBB & GSP Babat (A2) Subdivre Wil III Bojonegoro Divre Jatim PERUM BULOG
9	Bambang Noortjahjo	Kepala Gudang GBB Nambangan (B) Subdivre Wil IV Madiun Divre Jatim PERUM BULOG
10	Agus Narwanto	Kepala Gudang GSP Jeruk Gulung (A2) Subdivre Wil IV Madiun Divre Jatim PERUM BULOG
11	Drs. Andi Ali Husein	Kepala Gudang GBB Candirejo (A1) Subdivre Wil V Kediri Divre Jatim PERUM BULOG
12	Eddy Iramanto	Kepala Gudang GBB Arjasa (B) Subdivre Wil VI Bondowoso Divre Jatim PERUM BULOG
13	Drs. Dwi Santoso	Kepala Gudang GBB Kejapanan (A1) Subdivre Wil VII Malang Divre Jatim PERUM BULOG
14	Drs. Muhammad Hatta	Kepala Gudang GBB Kedung Asem (A1) Subdivre Wil VIII Probolinggo Divre Jatim PERUM BULOG
15	Suratmin	Kepala Gudang GSP Klasemen (A2) Subdivre Wil VIII Probolinggo Divre Jatim PERUM BULOG
16	Ir. Antok Hendriyanto	Kepala Gudang GBB Bence Blitar (A1) Subdivre Wil X Tulung Agung Divre Jatim PERUM BULOG
17	Dian Muchnar Budiasa	Kepala Gudang GBL Mangli (A1) Subdivre Wil XI Jember Divre Jatim PERUM BULOG
18	Netyo Nugroho	Kepala Gudang GBB Sumenep (B) Subdivre Wil XII Madura Divre Jatim PERUM BULOG
19	Waspodo	Kepala Gudang GSP Sidoharjo (B) Subdivre Wil XIII Ponorogo Divre Jatim PERUM BULOG
20	Samiran	Kepala Gudang GSP Madusari (A1) Subdivre Wil XIII Ponorogo Divre Jatim PERUM BULOG
21	Drs. Samsul Arifin	Kepala Gudang GBB Genteng (A1) Subdivre Wil IX Banyuwangi Divre Jatim Perum BULOG
22	Drs. Mochamad Ischaq, SP. MSi.	POPT Ahli Muda, Balai Besar Karantina Tumbuhan Tanjung Perak, Jl. Prapat Kurung Utara No 6 Tanjung Perak Surabaya, Telp. 031 3291273, 3284886, Fax 031 3297885
23	R. Bambang Sugiharto	PT JAPFA COMFEED INDONESIA Tbk, Jl. H.R. Moch. Mangundiprojo Km 3,5 Buduran Sidoarjo, Telp. 031 8921961, Fax 031 8963322

**PROGRAM OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR EAST JAVA AND EAST KALIMANTAN REGIONS**
Hotel Utami, Sidoarjo, 28 – 30 March 2007

Day/Date/Time	Program	Lecturer
Wednesday, 28 March 2007		
07.30 – 08.30	Registration of Participants	
08.30 – 09.00	Opening Ceremony :	
	- Address by SEAMEO BIOTROP	Dr. Okky Setyawati Dharmaputra
	- Address by Ministry of Environment	Mrs. Kusmulyani, MS.
	- Address by Perum BULOG and Opening of the Training	Mrs. Kiki Partini, MSc
09.00 – 10.15	Strategy and the Program of Ozone Layer Protection in Indonesia	Mrs. Kusmulyani, MS.
10.15 – 10.45	Break	
10.45 – 11.00	Pre Test	Committee
11.00 – 12.15	Integrated Storage Pest Management (ISPM))	1. Mr. Fasika Khaerul Z. 2. Mr. Teguh Setia Nugraha
12.15 – 13.00	Lunch	
13.00 – 14.00	ISPM (continuation)	
14.00 – 16.00	Introduction to Storage Insect Pest	1. Mr. Sunjaya (SEAMEO BIOTROP) 2. Mrs. Sri Widayanti (SEAMEO BIOTROP) 3. Mr. Fasika Khaerul Z. (Assistant for Quality Maintenance Group) 4. Mr. Teguh M. Sardjono, MSc. (Assistant for Warehousing Group) 5. Mrs. Husnul Khotimah Ramli (Assistant for ISPM Group))
16.00 – 16.15	Break	
16.15 – 17.45	Storage Mould in Grains	Dr. Okky S. Dharmaputra (SEAMEO BIOTROP)
17.45 – 19.00	Dinner	1. Dr. Purnama Hidayat 2. Mr. Fasika Khaerul Z. 3. Mr. Teguh Setia Nugraha
19.00 – 21.00	General Discussion about ISPM	1. Dr. Purnama Hidayat 2. Mr. Fasika Khaerul Z. 3. Mr. Teguh Setia Nugraha
Thursday, 29 March 2007		
	Field Practical Work (PKL)	
07.00 – 08.00	Leaving for warehouse GBB Buduran II	
08.00 – 10.00	- Briefing of Field Practical Work - Sampling Technique of Paddy and Milled Rice and Quality Analyses	1. Dr. Purnama Hidayat 2. Mr. Sunjaya 3. Mrs. Sri Widayanti 4. Mr. Fasika Khaerul Z. 5. Mr. Teguh M. Sardjono, MSc. 6. Mr. Teguh Setia Nugraha
10.00 – 10.15	Break	
10.15 – 12.00	Sampling Technique (continuation)	SEAMEO BIOTROP/KLH/BULOG
12.00 – 13.00	Lunch	
13.00 – 14.00	Quality Analyses (continuation)	SEAMEO BIOTROP/KLH/BULOG
14.00 – 15.30	Inspection of Integrated Storage Pest Management Preparation and Installing of Insect Traps	SEAMEO BIOTROP/KLH/BULOG
15.30 – 15.45	Break	
15.45 – 16.30	continuation	SEAMEO BIOTROP/KLH/BULOG

Friday, 30 March 2007		
	Field Practical Work (PKL)	
07.00 – 08.00	Leaving for warehouse GBB Buduran II	
08.00 – 10.15	Fumigation (opening and folding plastic sheet)	SEAMEO BIOTROP/KLH/BULOG
10.15 – 10.30	Break	
10.30 – 11.30	continuation	SEAMEO BIOTROP/KLH/BULOG
11.30 – 13.30	<i>Friday Prayer and Lunch</i>	
13.30 – 15.00	Monitoring of Storage Insect Pest (collecting and evaluating of the data)	SEAMEO BIOTROP/KLH/BULOG
15.00 – 16.30	Pesticide Application in Controlling Storage Pest (include post evaluation, and break)	SEAMEO BIOTROP/KLH/BULOG
16.30 – 17.30	Closing Ceremony	

4. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT (ISPM) FOR BANTEN REGION

In this training course SEAMEO BIOTROP also collaborated with Agency for Environmental Impact Control (*Badan Pengendalian Dampak Lingkungan/ BAPEDAL*) Banten Province. In this case BAPEDAL provide a lecture room and a place for practical work. This is the fourth Regional Training Course on ISPM.

The training was held at BAPEDAL Banten Province, Serang, from 23 to 25 May 2007.

The participants consisted of 11 with the breakdown as follows : 2 participant from BAPEDAL Banten Province, 3 participants from PT Suba Indah Tbk., 2 participants from PT Wonokoyo Jaya Kusuma, 2 participants from PT Cargill Indonesia, one participant from PT Biotek Sarana Industri, and one participant from Plant Quarantine Station Class II Merak (Table).

The lecturers of this training were a participants of the Training for Trainers of ISPM from PT Suba Indah Tbk. (Mr. Syamsul Rijal), assisted by lecturers from the Ministry of Environment (Mrs. Endang Pratiwi), National Project Coordinator (NPC)(Dr. Purnama Hidayat), SEAMEO BIOTROP (Dr. Okky Setyawati Dharmaputra, Mr. Sunjaya and Mrs. Sri Widayanti).

The materials for this course were similar with the materials given to the participants of the Training for Trainers on Integrated Storage Pest Management. Therefore the participants were given the modules and manuals of Integrated Storage Pest Management as well as Phosphine Fumigation Good Practices. The program of the training is presented in Table.

The opening of the training took place after the registration of participants. At the opening program of the training, the Program Coordinator Representative UNIDO Jakarta (Mr. Nahrudin Alie) delivered an address. Addresses were also delivered by the Director of SEAMEO BIOTROP (represented by Dr. Okky Setyawati Dharmaputra) and Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment (represented by Mrs. Endang Pratiwi). The Head of Agency for Environmental Impact Control (represented by Mr. Aris Munandar) delivered his address and officially declared open the training.

At the beginning of the training, an evaluation form containing question on ozone depleting substances (ODS), storage pest and integrated storage pests management was given to all the participants. The result of the evaluation is used as an indicator on the knowledge/capability of the participants prior to attend the training. At the end of the training course the participants were also requested to answer an evaluation form to find out whether their knowledge/capability has been improved.

Lecture activities were conducted in a room of BAPEDAL office, while practical works on introduction to storage insect pest and demonstration of phosphine fumigation were conducted at the yard of BAPEDAL office.

The lecture was started with Strategy and the Program of Ozone Layer Protection in Indonesia, and Towards the Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia, delivered by Mrs. Endang Pratiwi and Dr. Purnama Hidayat from Ministry of Environment, respectively.

A lecture on Integrated Storage Pest Management was given by Mr. Syamsul Rijal assisted by Dr. Purnama Hidayat. Mr. Syamsul Rijal was formerly a staff of PT Suba Indah Tbk., and he participated in Training for Trainers on ISPM (bogor, 24 – 28 April 2006). Lecture and practical work on Storage Insect Pest were given by Mr. Sunjaya, assisted by Mrs. Sri Widayanti; while a lecture on Storage Mould in Grain given by Dr. Okky Setyawati Dharmaputra. This topic of lecture was useful for the participants, because mould is the second important pest of stored grain after insect. The participants were interested in observing various mould species infecting stored peanuts.

A lecture on Monitoring of Storage Insect Pest was given by Dr. Purnama Hidayat. In his lecture Dr. Purnama Hidayat explained various insect traps (light trap, carton trap, bait trap, and sticky trap), and how to tabulate the data of monitoring result into a graph. The graph can give information on the trend toward the population development of storage insect pest.

Demonstration of phosphine fumigation good practices was given by Mr. Sunjaya. He explained how to conduct phosphine fumigation good practices, i.e. by using safety equipments, dosage concentration, appropriate application time, preparation of good fumigation implementation, etc.

General discussion was also conducted especially to get information on the opinions and suggestions given by the participants. In general the participants proposed the longer training duration, sustainable, and organized periodically; the number of participants should be increased, more practical works, demonstration of phosphine fumigation should be carried out in grain storage, the socialization of Ozone Depleting Substances (ODS) should be more disseminated to various industries/factories (including feedmill factories). Nevertheless, the participants considered that the lectures and practical works given during the training were good; the training was useful for the participants, because they were more familiar with various insects and moulds in stored grain.

The training was terminated with a closing ceremony. At the closing ceremony Dr. Okky Setyawati Dharmaputra presented her report on the result of the training. In her report she mentioned about the success of the training based on the final evaluation which showed an increase of knowledge improvement of the subjects compared to the result of evaluation made at the beginning of the training.

The training was officially closed by the Head of Section for Environmental Impact Control (Mr. Aris Munandar).

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR BANTEN REGION**
Serangi, 23 - 24 January 2007

No	Name	Institution
1	Drs. Suherdi, MSi.	Badan Pengendalian Dampak Lingkungan (Bapedal) Pemerintah Propinsi Banten Jl. Jend. Sudirman Komplek Perumahan Kota Serang Baru Ruko Glodok Blok D No. 5 Serang 42118, Telp/Fax : 0254 218811, 218807
2	Sofat Nahardian, SKom	Badan Pengendalian Dampak Lingkungan (Bapedal) Pemerintah Propinsi Banten Jl. Jend. Sudirman Komplek Perumahan Kota Serang Baru Ruko Glodok Blok D No. 5 Serang 42118, Telp/Fax : 0254 218811, 218807
3	Zuroaidah, SP.,MSi.	Stasiun Karantina Tumbuhan Kelas II Merak Jl. Raya Transit Merak, Cikuasa Pantai, Merak – BANTEN 42348, Telp :

		0254 571743, 571807, Fax : 0254 57807
4	Ahmad Zaky Zarkasyi	PT Cargill Indonesia Jl. Jakarta Serang Km 68 Kawasan Industri Modern Cikande Serang Banten, Telp. 0254 400417, Fax : 0254 400603
5	R. Ulis Sulistyanto, ST.	PT Cargill Indonesia Jl. Jakarta Serang Km 68 Kawasan Industri Modern Cikande Serang Banten, Telp. 0254 400417, Fax : 0254 400603
6	Okto Rudjianto, SPd.	PT Suba Indah Tbk Komp. Pelabuhan Khusus Cigading Cilegon, Jl Raya Cilegon Anyer Km 9, Ciwandan Cilegon Banten. Telp. : 0254 605640, Fax : 0254 601985/605641
7	R. Joni Harianto	PT Suba Indah Tbk Komp. Pelabuhan Khusus Cigading Cilegon, Jl Raya Cilegon Anyer Km 9, Ciwandan Cilegon Banten. Telp. : 0254 605640, Fax : 0254 601985/605641
8	Irfan Alfi, SAg.	PT Suba Indah Tbk Komp. Pelabuhan Khusus Cigading Cilegon, Jl Raya Cilegon Anyer Km 9, Ciwandan Cilegon Banten. Telp. : 0254 605640, Fax : 0254 601985/605641
9	Din Hadiansyah, SPt.	PT Wonokoyo Jaya Kusuma (Kabag QC/Lab) Jl Raya Rangkasbitung Km 2 Cikande Serang, Telp. : 0254 403333, Fax : 0254 400602, HP : 081323049896
10	Ir. Agus Supriyadi	PT Wonokoyo Jaya Kusuma Jl Raya Rangkasbitung Km 2 Cikande Serang, Telp. : 0254 403333, Fax : 0254 400602
11	Drh. Kusyanto	PT Biotek Sarana Industri Jl. M.H.Thamrin No.8 Gedung BPPT Lt 15.24 Jakarta 10340, Telp. : 021 3168639, 31909716, Fax : 021 31909719

**PROGRAM OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT
FOR BANTEN REGION**
Serang, 23 - 24 May 2007

Day/Date/Time	Program	Lecturer
Wednesday, 23 May 2007		
08.30 – 09.00	Registration of Participants	
09.00 – 09.30	Opening Ceremony	
09.30 – 09.45	Pre Evaluation	Committee
09.45 – 10.15	Break	
10.15 – 11.15	Strategy and the Program of Ozone Layer Protection in Indonesia	Mrs. Endang Pratiwi
11.15 – 12.15	Towards the Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia	Dr. Purnama Hidayat
12.15 – 13.15	Lunch	
13.15 – 14.45	Introduction to Storage Insect Pest	Mr. Sunjaya Mrs. Sri Widayanti

14.45 – 15.00	<i>Break</i>	
15.00 – 17.00	Storage Mould in Grains	Dr. Okky Setyawati Dharmaputra
Thursday, 24 May 2007		
08.00 – 10.00	Integrated Storage Pest Management (ISPM)	Mr. Samsul Rijal Dr. Purnama Hidayat
10.00 – 10.15	<i>Break</i>	
10.15 – 12.00	Monitoring of Storage Insect Pest	Dr. Purnama Hidayat Mr. Sunjaya Mrs. Sri Widayanti
12.00 – 13.00	<i>Lunch</i>	
13.00 – 15.00	Phosphine Fumigation Good Practices	Mr. Sunjaya Dr. Purnama Hidayat
15.00 – 15.15	Post Evaluation	Committee
15.15 – 15.30	<i>Break</i>	
15.30 – 16.30	General Discussion	All lecturers
16.30 – 17.00	Closing Ceremony	

5. REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT (ISPM) FOR SOUTH SULAWESI REGION

In this training course SEAMEO BIOTROP collaborated with Perum BULOG and PT Eastern Pearl Flour Mills. In this case, Perum BULOG and PT Eastern Pearl Flour Mills provided a lecture room and a warehouse for practical work. This is the fifth Regional Training Course on ISPM.

The training was held at Yasmin Hotel, Modern and Old Warehouses [*Gudang BULOG Modern (GBM) and Gudang BULOG Lama (GBL)*] Panaikang Perum BULOG Subdivre Region Makassar, Divre South Sulawesi, and PT Eastern Pearl Flour Mills factory, in Makassar, on 18 to 20 June 2007.

In fact the training course was planned to be attended by 10 participants, but in this training, with the cooperation of Perum BULOG, the number of participants became 22 with the breakdown as follows : 17 participants from Perum BULOG Divre South Sulawesi, 2 participants from PT Eastern Pearl Flour Mills, one participant from Plant Quarantine Station Class I Makassar (*Balai Karantina Tumbuhan Kelas I Makassar*); and one participant from Center of Environment Management Sulawesi Maluku and Papua Regions (*Pusat Pengelolaan Lingkungan Hidup Sulawesi Maluku dan Papua*); and one participant from Department of Pest and Plant Disease, Faculty of Agriculture, Hasanuddin University (Table).

The lecturers of this training were the participants of the Training for Trainers of ISPM from Perum BULOG Divre South Sulawesi (Mrs. Siti Mardati Saing) and East Kalimantan (Mr.

Fasika Khaerul Zaman); from Perum BULOG DKI Jakarta (Mrs. Husnul Khatimah Ramli) and PT Eastern Pearl Flour Mills (Mr. Eriil S. Rilwan), assisted by lecturers from the Ministry of Environment (Mrs. Endang Pratiwi), National Project Coordinator (NPC) (Dr. Purnama Hidayat), and SEAMEO BIOTROP (Dr. Okky Setyawati Dharmaputra and Mrs. Sri Widayanti).

The materials for this course were similar with the materials given to the participants of the Training for Trainers on Integrated Storage Pest Management. Therefore the participants were given the modules and manuals of Integrated Storage Pest Management as well as Phosphine Fumigation Good Practices. The program of the training is presented in Table.

The opening of the training took place after the registration of participants. At the opening program of the training, the Head of Perum BULOG Divre South Sulawesi (Mr. Abdul Karim, MBA), as the host, delivered his address to the lecturers, participants and invited guests. Program Coordinator Representative UNIDO Jakarta (Mr. Nahrudin Alie) also delivered an address, followed by address from Deputy Minister for Nature Conservation Enhancement and Environmental Destruction Control, Ministry of Environment (represented by Mrs. Tri Widayati, MT.) and Director of SEAMEO BIOTROP (represented by Mr. Ith Vuthy, MSc.MA.). The Director of Human Resources and General of Perum BULOG (Mr. Agus Syaifullah, MSc.) attended the training and delivered his address, and also officially declared open the training.

The opening of the training was also attended by the Head and Deputy Head of Perum BULOG Divre South Sulawesi, Head of Divre Central Sulawesi, Head of Divre Southeast Sulawesi, Head Section of Administration and Finance, Head Section of Public Service, Head Section of Commercial and 7 Head of Subdivre (Polmas, Pare-pare, Sidrap, Wajo, Bulukumba, Palopo, and Makassar). The Policy of Perum BULOG Divre South Sulawesi in inviting the Head of Divre and Subdivre were the form of serious attention on the success of ISPM program, especially at Perum BULOG.

On the first day, the activity of the training was carried out at Yasmin Hotel, Makassar, in the form of lectures and practical work, while on the second and third days practical field work (PKL) were given at the milled rice warehouse of Perum BULOG GBM and GBL Panaikang, Sub Divre Makassar, Divre South Sulawesi, and PT Eastern Pearl Flour Mills factory.

At the beginning of the training, all the participants of the training should answer an evaluation from containing questions on ODS, storage pest and integrated storage pests management. The result of the evaluation is used as an indicator on the capability/knowledge

of the participants prior to attend the training. At the end of the training course the participants were also requested to answer an evaluation form to find out whether their knowledge/capability have been improved.

The lecture was started with Strategy and the Program of Ozone Layer Protection in Indonesia, delivered by Mrs. Endang Pratiwi, from Ministry of Environment. A lecture on Integrated Storage Pest Management was given by Mrs. Siti Mardati Saing, from Perum BULOG Divre South Sulawesi. Lecture and Practical Work on Storage Insect Pest were given by Mrs. Sri Widayanti. Various species of storage insect pest were introduced to the participants. It is expected that the participants will be able to identify storage insect pest easily, also they will know how to monitor and to control the insects. The following lecture was Storage Mould in Grain, given by Dr. Okky Setyawati Dharmaputra. This topic of lecture was useful for the participants, because mould is the second important pest of stored grain after insect. The participants were interested in observing various species of mould infecting stored peanuts.

PKL was open by the Head of Perum BULOG Subdivre Makassar (Mr. Ramli Hasan, MSi.), after he delivered his address. Practical works on analyses of paddy and milled rice quality maintenance, insect monitoring, phosphine fumigation, and insecticide spraying were given to the participants.

The practical work activities which got serious attention were preparing, installing and collecting of data from various insect traps i.e. carton trap, bait trap, sticky trap, and also light trap. This was due to the use of various insect traps to determine the population of storage insect pests which was a new technique for staff members of Perum BULOG. Participants were very enthusiastic because of the superiority in the use of these insect traps to determine the storage insect pest population which does not require sampling of rice. Especially for light trap, it has more advantage in trapping moth which could not be trapped by another traps (carton, sticky and bait trap). The use of light trap is useful to support the policy of Perum BULOG, among others their warehouses should be free from *Ephestia*. To know the storage insect population, usually sampling of milled rice as much as 1 kg for every sample bag using a probe (a spear sampler). The participants expected that the monitoring technique for pest using insect traps could be adopted and implemented at Perum BULOG circle. Nevertheless, this technique has its weaknesses i.e. there is no correlation data between the determined population based on catch and level of damage. Further researches are still needed.

All participants conducted practical works on phosphine fumigation good practice and insecticide spraying, after Mr. Fasika Khaerul Zaman gave them some directions.

The third day of the training (second day of PKL) consisted of insect monitoring and to observe the result of trapped insects. The data obtained from each type of trap were tabulated and presented in the form of graphs. The graphs can be used to get information on the trend of population development of storage insect pest.

On the second day, participants also visited PT Eastern Pearl Flour Mills (PT EPFM), a wheat mill and wheat flour factory. Mr. Awaluddin assisted by Mr. Eri S. Rilwan gave a presentation on the effort and success of PT EPFM in implementing ISPM. The effort to implement ISPM was initiated since Mr. Eri S. Rilwan, a staff of PT EPFM participated in Training for Trainers of ISPM (Bogor, 24 – 28 April 2006). Since then, PT EPFM formulated the methods of implementing ISPM by establishing Hygiene Integrated Team (HIT). In this activity, internal audit or among departments are carried out once in a week. The result of the audit was followed up for improvement. By implementing ISPM, the paradigm of storage pest control was changed. At the beginning, the portion of using insecticide was bigger than insect monitoring, the cleanliness and maintenance of building and warehouse. Nowadays it was changed as follows : the portion of cleanliness and maintenance of building and warehouse was the biggest, followed by insect monitoring and using insecticide.

The training course was terminated with a closing ceremony. It was conducted at PT EPFM. Mrs. Sri Widayanti from SEAMEO BIOTROP presented her report on the result of the training. In her report she mentioned about the increase of the result (value) which means the participants knowledge on the subject have been improved. She also delivered thanks to Perum BULOG and PT EPFM for kind cooperation. At the closing ceremony, an address was delivered by the Deputy Director for Administration and Finance of PT EPFM (Mr. Fachri Rahman), followed by Ministry of Environment (Mrs. Endang Pratiwi). Finally, the Deputy Head of Perum BULOG Divre South Sulawesi (Mr. Faris Bahtiar) delivered his address and officially the training closed.

**LIST OF PARTICIPANTS OF THE REGIONAL TRAINING COURSE ON
INTEGRATED STORAGE PEST MANAGEMENT FOR SOUTH SULAWESI REGION**
Hotel Yasmin, Makassar, 18 - 20 June 2007

No	Name	Institution
1	HAMIDAH,SSI.	Pusat Pengelolaan Lingkungan Hidup Regional Sulawesi Maluku dan Papua Jl. Perintis Kemerdekaan Km 17 Makassar, Telp : 0411 555701, Fax : 0411 555703, HP : 08124275652
2	IR. SULAHA THAMRIN, MSI.	Jurusan Hama dan Penyakit Tumbuhan, Fakultas Pertanian, Universitas Hasanuddin Jl. Perintis Kemerdekaan Km 10 Makassar, Telp/Fax : 0411 587100, HP : 085242013634
3	DRA. TUTI MURDIATI	Balai Karantina Tumbuhan Kelas I Makassar Jl. Karantina No. 2 Karuwisi Makassar, Telp : 0411 434508, Fax : 0411 432987, HP : 081355200999
4	AWALUDDIN	PT Eastern Pearl Flour Mills Jl. Hatta No. 302 Makassar, Telp. 0411 322220, Fax : 0411 319454, e-mail : awaluddin@epflour.com, HP : 08124228643
5	HERI ANDATOMI	PT Eastern Pearl Flour Mills Jl. Hatta No. 302 Makassar, Telp. 0411 322220, Fax : 0411 319454, HP : 0811410317
6	SEM SISWA USMAN	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL I POLMAS DIVRE SULSEL
7	ABDUL RAHMAN	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL II PARE-PARE DIVRE SULSEL
8	SYAMSUL BACHRI	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL III SIDRAP DIVRE SULSEL
9	SYAHRUDDIN SYAM	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL IV WAJO DIVRE SULSEL
10	B A K R I	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL V BULUKUMBA DIVRE SULSEL
11	ANDI MUHLIS	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL VI PALOPO DIVRE SULSEL
12	Z A I N U D D I N	PJS. KEPALA SUB SEKSI PERAWATAN KUALITAS SUBDIVRE WIL VII MAKASSAR DIVRE SULSEL
13	UMAR LATIEF, S.SOS	KEPALA GUDANG GBL POLEWALI & GSP AMMASENGGENG (B) SUBDIVRE WIL I POLMAS DIVRE SULSEL
14	SURYANTO	KEPALA GUDANG GBM LAPADDE 2 (A1) SUBDIVRE WIL II PARE-PARE DIVRE SULSEL
15	MUHAMMADIYAH.	JURU TIMBANG GBB BULU PINRANG (B) SUBDIVRE WIL II PARE-PARE DIVRE SULSEL
16	RUSTAM SIRATANG	KEPALA GUDANG GSP LANCIRANG (B) SUBDIVRE WIL III SIDRAP DIVRE SULSEL
17	ISKANDAR	KEPALA GUDANG GBL LABURAUNG (B) SUBDIVRE WIL III SIDRAP DIVRE SULSEL
18	Y E N S A N G	KEPALA GUDANG GSP LAPPARIAJA (B) SUBDIVRE WIL IV WAJO DIVRE SULSEL

19	SULTAN ACHMAD	KEPALA GUDANG GSP ULUGALUNG , GBL SK & GBL TMP (B) SUBDIVRE WIL IV WAJO DIVRE SULSEL
20	S A M S O N	KEPALA GUDANG GBL SINJAI KOTA & GBB MANGOTTONG (B) SUBDIVRE WIL V BULUKUMBA DIVRE SULSEL
21	DARMAWIS RAMLI	KEPALA GUDANG GBB MANGKUTANA (B) SUBDIVRE WIL VI PALOPO DIVRE SULSEL
22	JOHAN JONI	KEPALA GUDANG GBB LEMBANG & GSP SIPANANG (B) SUBDIVRE WIL VII MAKASSAR DIVRE SULSEL

Table

PROGRAM OF THE REGIONAL TRAINING COURSE ON INTEGRATED STORAGE PEST MANAGEMENT FOR SOUTH SULAWESI REGION

Hotel Yasmin, Makassar, 18 - 20 June 2007

Day/Date/Time	Program	Lecturer
Monday, 18 June 2007		
07.30 – 07.45	Registration of Participants	
07.45 – 08.00	Preparation of Opening Ceremony	
08.00 – 08.30	Opening Ceremony	Remarks by : - UNIDO (Mr. Nahrudin Alie) - KLH (Mrs. Tri Widayati, MT.) - SEAMEO BIOTROP (Mr. Ith Vuthy, MSc.MA.) - Perum BULOG (Mr. Agus Saifullah, MSc.)
09.30 – 09.45	<i>Break</i>	
09.45 – 10.00	Pre Evaluation	Committee
10.00 – 11.15	Strategy and the Program of Ozone Layer Protection in Indonesia	Mrs. Endang Pratiwi
11.15 – 12.15	Integrated Storage Pest Management (ISPM)	- Head Section PQC South Sulawesi (Mrs. Siti Mardati Saing) - PT Eastern Pearl Flour Mills (Mr. Eri S. Rilwan)
12.15 – 13.00	<i>Lunch</i>	
13.00 – 14.00	ISPM (continuation)	
14.00 – 15.30	Introduction to Storage Insect Pest	- Mrs. Sri Widayanti - Dr. Purnama Hidayat
15.30 – 15.45	<i>Break</i>	
15.45 – 16.30	Introduction to Storage Insect Pest (continuation)	
16.30 – 18.00	Storage Mould in Grains	Dr. Okky S. Dharmaputra
18.00 – 19.00	Dinner	
19.00 – 21.00	Policy of Procurement and Quality Maintenance of Perum BULOG	Head Division of Quality Maintenance, Perum BULOG (Mr. Rito Angky, MM.)

Tuesday, 19 June 2007		
	Field Practical Work (PKL)	
07.00 – 08.00	Leaving for warehouse GBM and GBL Panaikang	
08.00 – 10.00	Sampling Technique of Paddy and Rice Milled and Quality Analyses	1. Dr. Purnama Hidayat 2. Mrs. Sri Widayanti 3. Mrs. Endang Pratiwi 4. Mr. Fasika Khaerul Z. 5. Mrs. Husnul Khotimah Ramli
10.00 – 12.00	Inspection of Integrated Storage Pest Management Preparation and Installing of Insect Traps	SEAMEO BIOTROP/KLH/BULOG
12.00 – 13.00	<i>Lunch</i>	
13.00 – 15.15	Fumigation (opening and folding plastic sheet)	SEAMEO BIOTROP/KLH/BULOG
15.15 – 15.30	Break	
15.30 – 17.00	Pesticide Application in Controlling Storage Pest and Demonstration of Spraying	SEAMEO BIOTROP/KLH/BULOG
17.00 – 18.00	Back to hotel	
Wednesday, 20 June 2007		
	Field Practical Work (PKL)	
07.00 – 08.00	Leaving for warehouse GBM and GBL Panaikang	
08.00 – 10.00	Monitoring of Storage Insect Pest (collecting and evaluating of the data) Post Evaluation	SEAMEO BIOTROP/KLH/BULOG
10.00 – 11.00	Leaving for PT Eastern Pearl Flour Mills and discussion	
11.00 – 12.00	Address by Deputy Director for Administration and Finance PT Eastern Pearl Flour Mills	Mr. Fachri A. Rahman
12.00 – 13.00	Lunch	
13.00 – 15.00	Field Study at PT Eastern Pearl Flour Mills factory and warehouse	Mr. Eri S. Rilwan Mr. Awaluddin Mr. Bambang Suharnanto
15.00	Closing Ceremony	

CHAPTER V

PROVISION OF BASIC EQUIPMENT FOR METHYL BROMIDE PHASE-OUT

5.1. EQUIPMENTS FOR PHOSPINE FUMIGATION

DAFTAR CALON PENERIMA PERALATAN FUMIGASI

No.	Address
1	PERUM BULOG Jl. Gatot Subroto 49, Jkt 12950 Tlp (021) 5252209, Fax (021) 5204334
2	Badan Karantina Pertanian, Pusat Karantina Tumbuhan, DEPTAN Jl. Harsono RM 3, Gd E Lt V Ragunan, Psr.minggu, Jaksel 12550 Tlp (021) 7816482, Fax 7816482
3	PT SUCOFINDO Jl. Cumi No. 33-35, Jakarta, Tlp (021) 4304444, Fax (021) 43912602, e-mail: Jsarjono@sucofindo.co.id
4	PT Hanna Kreasi Gemilang Jl. Budi Mulya Utara I/14 Rt 06/013 Jakarta Utara, Tlp (021) 6401322, Fax (021) 6408018, hanna_kreasi@cbn.net.id
5	PT Resour International Jl. Kuning Tua Block C 7 No. 17, Kelapa Gading, Jakarta Utara 14240, Tlp (021) 45859733, Fax (021) 4507267, resour_intl@cbn.net.id
67	PT Multitech Yasa Guna Jl. H. Kelik No. 21, Kelapa Dua, Kebun Jeruk, Jakarta Barat, Telp. : (021) 5324067, 5303148, Fax : (021) 5324079, e-mail: multitech@indo.net.id
8	PT Era Resik Hunian Jl. Panjang No. 74 Sukabumi Selatan Kebun Jeruk, Jakarta Barat, Telp. : (021) 5305449, Fax (021) 5357843
9	PT Dimensi Jl. Cempaka Raya No. 7 Jakarta Pusat, Tlp. (021) 4253940 Fax (021) 4204744
10	PT Keraton Alam Indonesia Jl. Petamburan VI/29A, Jakarta Pusat. Tlp. (021) 53650384 Fax (021) 53650384
11	PT Protek Jl. Joe No. 9 Lenteng Agung Jakarta Selatan, Telp. : (021) 78838789, Fax (021) 78838789
12	PT Higindo Kinerja Chemica

No.	Address
	Jl. Tebet Timur Dalam XI No. 77 Jakarta, Tlp. (021) 83796139 Fax (021) 83702521
13	PERUM BULOG DIVRE JABAR Jl. Soekarno Hatta No. 711 A, Bandung, Tlp (022) 7303093 Fax (022) 7303092
14	PT Agricon Putera Citra Optima (Terminix) Jl. Siliwangi No. 68 Bogor. Tlp (0251) 313070 ext 184, Fax: (0251) 353508
15	Balai Besar Litbang Pascapanen Jl. Tentara Pelajar No 12 A, Bogor. Tlp (0251) 321762, Fax (0251) 321762
16	PT Suba Indah Tbk Komp. Pelabuhan Khusus Cigading Cilegon, Jl Raya Cilegon Anyer Km 9, Ciwandan Cilegon Banten. Tlp (0254) 605640 Fax (0254) 605641, e-mail: syamsul_rijal@telkom.net
17	PT Sriboga Raturaya Jl. Deli No.10 Tanjung Emas, Semarang 50174, Tlp (024)3558373 Fax (024)3553800, e-mail: yuli.basuki@sriboga-smg.co.id
18	PERUM BULOG DIVRE JATENG Jl. Menteri Supeno I/I, Semarang, Tlp (024) 8412290 Fax (024) 8412369
19	PERUM BULOG DIVRE JATIM Jl. Jend. A. Yani No. 146-148 Surabaya, Tlp (031) 8291977 Fax (031) 8292818
20	PERUM BULOG DIVRE LAMPUNG Jl. Cut Meuthia No. 29 Bandar Lampung, Tlp (0721) 487947 Fax (0721) 484125
21	PERUM BULOG DIVRE SUMATERA UTARA Jl. Jend. Gatot Subroto No. 180 Medan, Tlp (061) 8451361 Fax (061) 8452465
22	PERUM BULOG DIVRE KALIMANTAN TIMUR Jl. Jend. Sudirman No. 335, Balikpapan, Tlp (0542) 422240 Fax (0542) 422220
23	PERUM BULOG SUBDIVRE WIL II PARE-PARE Jl. A.P. Petarani Selatan Makasar 90222, Tlp (0411) 854410 Fax (0411) 854411
24	PT Eastern Pearl Flour Mills Jl. Hatta No. 302, Makassar, Tlp (0411) 322220, Fax (0411) 319454, e-mail: imron@epflour.com
25	PT PAN Asia Superintendence Jl. Bonerate No.11 A, Makassar, Tlp (0411) 315823, Fax (0411) 320307, e-mail: Panasia@telkom.net
26	SEAMEO BIOTROP Jl. Raya Tajur Km 6, PO Box 116, Bogor, Tlp (0251) 323848, Fax (0251) 326851, info@biotrop.org

No.	Address
27	SEAMEO BIOTROP Jl. Raya Tajur Km 6, PO Box 116, Bogor, Tlp (0251) 323848, Fax (0251) 326851, info@biotrop.org
28	Kementerian Lingkungan Hidup Jl. D.I. Panjaitan kav 24 Kebon Nanas, Jkt Timur 13410, Tlp (021) 8517164 Fax (021) 85902521

Table. List of Equipments for Phosphine Fumigation

No	Equipments
1	Cover plastic sheets 33 x 33 m
2	Sand snake/chain
3	Gas sampling lines
4	Phosphine meter high concentrations
5	Phosphine leak detector for low concentrations
6	Full face gas masks, 2/team, B2 filters, 5/mask
7	Safety (2 mist A2P3 canisters/mask)

4.5. EQUIPMENTS FOR INTEGRATED STORED PEST MANAGEMENT

No	Perusahaan
1	PERUM BULOG Jl Gatot Subroto 49, Jkt 12950 Tlp (021) 5252209, Fax (021) 5204334
2	PT Suba Indah Tbk Komp. Pelabuhan Khusus Cigading Cilegon, Jl Raya Cilegon Anyer Km 9, Ciwandan Cilegon Banten. Tlp (0254) 605640 Fax (0254) 605641, e-mail: syamsul_rijal@telkom.net
3	PERUM BULOG DIVRE JABAR Jl. Soekarno Hatta No. 711 A, Bandung, Tlp (022) 7303093 Fax (022) 7303092
4	PT Garudafood Putra Putri Jaya Coated Pati Jl. Raya Pati Juwana No.2,3 Pati Jawa Tengah. Tlp (0295) 381673 Fax (0295) 383863
5	PERUM BULOG DIVRE JATIM Jl. Jend. A. Yani No. 146-148 Surabaya, Tlp (031) 8291977 Fax (031) 8292818

6	PT Eastern Pearl Flour Mills Jl. Hatta No. 302, Makassar, Tlp (0411) 322220, Fax (0411) 319454, e-mail: imron@epflour.com
7	SEAMEO BIOTROP Jl. Raya Tajur Km 6, PO Box 116, Bogor, Tlp (0251) 323848, Fax (0251) 326851, info@biotrop.org
28	Kementerian Lingkungan Hidup Jl. D.I. Panjaitan kav 24 Kebon Nanas, Jkt Timur 13410, Tlp (021) 8517164 Fax (021) 85902521

Table. List of Equipments for ISPM

No	Items
1	Digital Thermometer and RH meter
2	Sprayer
3	Bait trap
4	Yellow sticky trap
5	Carton Trap
6	Light Trap

CHAPTER VI

POLICY AND REGULATION

6.1. IMPORT LICENSING SYSTEM

Decree of the Trade Ministry (KEPMEN24, 2006?)

6.2. REGULATION ON IMPORTING, DISTRIBUTION, AND USING OF METHYL BROMIDE

It is very important to install an effective system to control import of MB, since so far the biggest problem in controlling MB use in Indonesia is illegal import. The system must be interdepartmental include Department of Monetary, Department of Agriculture, Department Trade, Department of Industrial, and Ministry of Environment. The activities include coordination meetings among the departments and drafting a comprehensive regulation. The coordination meetings to draft the regulation is scheduled for at least 5 times. To install a system to control illegal import, distribution and use of MB. The system will be the interdepartmental responsibility. This system is expected to produce accurate data of the use of MB in the country.

Some of them were import licensing system, quota for importing Methyl Bromide non-QPS and QPS, supervision on distribution and use of Methyl Bromide. One of the most important achievement in this matter was the Decree of Trade Ministry (No 51 - 2007) that Methyl Bromide was banned import for non-QPS since 1 January 2008 as well as regulation in labelling of Methyl Bromide import for QPS purpose. In the decree was mentioned that all Methyl Bromide for QPS purpose must be labelled " FOR QPS ONLY".

The Ozon Unit has been coordinating related departments (Department of Agriculture, Department of Trade, Department of Health, Department of Finance, Department of Industry, and Plant Quarantine Agency) to formulate Standard Operating Procedure for monitoring Ozone Depleting Substances (including Methyl Bromide) distribution.

CHAPTER VII

PROJECT MONITORING AND ADMINISTRATION

7.1. PROJECT MONITORING

1. Monitoring of ISPM Implementation

After the completion of training course on ISPM, the participants should implement their knowledge gained in this training in their home region. The results of the implementation were monitored by the training committee of SEAMEO BIOTROP accompanied by the staff of Ministry of Environment and National Project Coordinator (NPC).

The objective of this activity was to get information concerning the results obtained by the participants in implementing their knowledges gained during training for trainers on ISPM in their home region.

Monitoring of ISPM implementation was conducted in the institutions of the respective participants training for trainers on ISPM. They were Perum BULOG Divre West Java (West Java province), PT Garudafood (Central Java province), PT Suba Indah Tbk. (Banten province), Perum BULOG Divre South Sulawesi and PT Eastern Pearl Flour Mills (South Sulawesi province), Perum BULOG Divre East Java (East Java province), Perum BULOG Divre East Kalimantan (East Kalimantan province) and Perum BULOG Divre DKI Jakarta (DKI Jakarta region). Participants from Ministry of Environment and Plant Quarantine Service as related institutions were not obliged to implement their knowledges gained during training for trainers on ISPM, because they do not have any warehouses to store grains.

The description of monitoring implementation was based on the results of the completed checklists filled out during the monitoring. The form of checklist is presented in Table.

The result of monitoring implementation of ISPM at the institution of participants of the Training of Trainers on ISPM were :

a. Perum BULOG Divre West Java

Monitoring of ISPM implementation in Perum BULOG Divre West Java was conducted at Gudang BULOG Baru (GBB) Dayeuh Kolot Sub Divre I, Bandung on 22 – 23 September 2006.

Gudang BULOG Baru (GBB) Dayeuh Kolot Sub Divre I Bandung stores milled rice with the capacity of 3500 tons. The name of warehouse keeper is Mr. Wawan Setiawan.

The implementation of ISPM at GBB Dayeuh Kolot Sub Divre I Bandung in relation with pest prevention has been conducted properly, such as the sanitation of the warehouses and their surroundings, the equipment for cleaning the warehouses, and the sufficient number of personnel. GBB Dayeuh Kolot Sub Divre I Bandung has Standard Operational Procedure (SOP) for commodities before storage. Management of commodities supply has also been applied properly, i.e. by using rotation of commodities supply system first in first out (FIFO). The data of storage duration of unhulled rice and milled rice is reported regularly. By using FIFO system, commodities that are firstly stored in the warehouse, they will also be taken out firstly. Therefore, the quality of the commodities will be guaranteed.

Perum BULOG has a special staff to control and to inspect milled rice quality. Quality Control Official (= *Petugas Kontrol Kualitas/PPK*) are assigned to control milled rice when they are still at business partner, while Quality Inspector Officials (= *Petugas Pemeriksa Kualitas/PPK*) are assigned to inspect milled rice before they are stored in the warehouse.

In the implementation of ISPM program, the important phase is to inspect and to monitor the quality of commodity, the existence and the level of pest infestation on the stored commodity. These activities are important to decide for controlling stored product pest. ISPM program on inspection or monitoring aspects has been implemented in accordance with SOP for monitoring stored product pest and the quality of commodity during storage. The SOP was issued by Perum BULOG and it is valid for the whole Divre and Sub Divre Perum BULOG in Indonesia.

The implementation of monitoring consists of :

Observation was conducted towards the condition either surrounding or on the top of the stack in the afternoon. Based on the observation the level of insect infestation was stated as follows :

a. U/T (None, *Tidak ada*)

No insect pest after inspection.

b. U/R (Light, *Ringan*)

Few number of insect pest was observed on several locations (on the surface of sack).

c. U/S (Moderate, *Sedang*)

More insect pest was observed on various locations (on the surface of sack).

d. U/B (Heavy, *Berat*)

High number of insect pest was observed directly, i.e. flying and creeping surrounding the stack. They were then gathered on the floor surrounding the base of the stack and on the top of the stacks.

e. U/SB (Very Heavy, *Sangat Berat*)

Very high number of insect pest was observed surrounding the stack. Their sound (chattering) derived from inside of the sack can be heard clearly. Dead insects could be found on the base of floor surrounding the stack and on the top of the stack.

On general observation (U), especially for moth, there are some additional criteria, besides the criteria that have been mentioned previously. The level of insect infestation could also be as follows :

a. U/T (None, *Tidak ada*)

No indication on the infestation of moth larvae (white granules/leftovers from feces) was observed outside of the sack.

b. U/R (Light, *Ringan*)

Few number of white granules/leftovers from feces was observed outside of the sack.

c. U/S (Moderate, *Sedang*)

Moderate number of white granules/leftovers from feces was observed outside of the sack.

d. U/B (Heavy, *Berat*)

High number of white granules/leftovers from feces was observed outside of the sack.

e. U/SB (Very Heavy, *Sangat Berat*)

Very high number of white granules/leftovers from feces was observed outside of the sack, consequently they were piled up on the floor.

Observation was also made on warehouse building (G), especially the parts of the building presumed to be hiding places of insect pest, i.e. protected places from light. The results of the observation could be as follows :

a. G/T (None, *Tidak ada*)

No insect found on the wall, floor, flounders, pillars, etc.

b. G/R (Light, *Ringan*)

Sometimes insects were observed in a group of 2 – 3 on the parts of the building.

c. G/S (Moderate, *Sedang*)

Insects were observed in groups on the parts of the building.

d. G/B (Heavy, *Berat*)

Insects were observed directly in many places of parts of the building. The insect creeps on the parts of the building.

e. G/SB (Very Heavy, *Sangat Berat*)

Very high number of insects were observed as black layer to cover the parts of the building.

Sample Observation (*Pengamatan Sampel, C*)

Sampling to monitor insect pest on milled rice was conducted in the morning until afternoon (at 01.00 p.m.), because the insect was inside of the sack at this time. Therefore, sampling should be conducted when the insect was still inside of the sack. Sampling should be conducted based on the following criteria :

- 1) the determination of the sacks for sampling was conducted randomly,
- 2) at least two samples (@ 1 kg) were taken from each warehouse
- 3) the value of level of insect infestation was based on the average of the two samples to reduce the number of samples, this criteria on Table 1 could be followed.

Table 1. The direction for sampling of the number of sacks based on the total number of sacks in the warehouse

Number of sacks in the warehouse	Number of sample sacks
7 - 270	5
271 - 630	10
631 - 1140	15
1141 - 1800	20
1801 -2610	25
> 2611	30

The samples were taken using a spear sampling. Each sample was reduced to 1 kg, it was then sifted to separate the insects from milled rice. The number of insects was then determined. The result of observation was determined as follows :

a. C/T (None, *Tidak ada*)

No alive insect from the result of sifting.

b. C/R (Light, *Ringan*)

1 – 2 alive insects were found in the sample.

c. C/S (Moderate, *Sedang*)

3 – 5 alive insects were found in the sample.

d. C/B (Heavy, *Berat*)

6 – 10 alive insects were found in the sample.

e. C/SB (Very Heavy, *Sangat Berat*)

> 10 alive insects were found in the sample.

Monitoring was conducted periodically (every 15 days). At the time of monitoring, at GBB Dayeuh Kolot Sub Divre I Bandung *Tribolium* sp. was found with light level of infestation. Rat infestation was not found. The use of monitoring equipment in the form of insect traps (light trap, bait trap, carton trap and sticky trap) has not been implemented yet. It was due to the lack of insect observer official to count the number of caught insects in the traps. Moreover, it will be time-consuming if the population of the insect is high enough.

Control of insect has been implemented chemically using insecticide (spraying and phosphine fumigation). Perum BULOG has already storage pest control official and SOP for controlling storage pest. Although monitoring of insect pest infestation has been implemented periodically using spear sampling, insect pest control using spraying was still conducted once within one month. Therefore, spraying was not based on monitoring results, while fumigation was conducted based on monitoring results. In general, fumigation was carried out once within three months.

SOP ISPM is used as guidelines for warehouse sanitation and its environment, commodity, method of storing or piling of commodity; monitoring and controlling of pest, standard of milled rice quality, etc are valid for all warehouses belonging to Perum BULOG.

In general the policy of ISPM implementation at Perum BULOG Divre West Java was supported by the management side.

b. PT Garudafood

In fact PT Garudafood represented Central Java province. Due to technical problem concerning the readiness of its warehouse in Central Java, monitoring has been conducted at the warehouse of PT Cornindo Boga Jaya, an affiliated firm of PT Garudafood. Monitoring of ISPM implementation was conducted on 17 October 2006. PT Cornindo Boga Jaya is located in Jl. Raya Serang Km 14.5 Cikupa, Tangerang 15710.

The warehouse belongs to PT Cornindo Boga Jaya stored raw materials in the form of imported corn for preparing pop corn. The name of warehouse keeper is Mr. Aviandre. He is also the factory manager.

The warehouse has just been operated recently, equipped with air conditioner. To prepare warehouse free from insect infestation before being used to store corn, insecticides was sprayed inside of the warehouse. Two weeks after, phosphine fumigation was conducted for five days. In February 2006 imported corn was entered in the warehouse, and then fumigation was carried out in April 2006. In August 2006 psocid was found on the surface of the sack, while in October 2006 it was found inside of the sack. Consequently, the warehouse has been refumigated on 20 October 2006.

PT Cornindo Boga Jaya has implemented ISPM for prevention, monitoring or inspection, as well as managerial aspects. Prevention aspect can be observed from the cleanliness of the warehouse, either inside or its surroundings. Special attention was paid to the initial quality of commodity, because the stored commodity will be processed and consumed thereafter. SOP for the cleanliness of the warehouse and the quality of the commodity are available. The rotation of commodity stock using FIFO system has not been implemented yet, because the warehouse has just been operated recently. The commodity was still derived from the same procurement. Nevertheless, FIFO system will be applied, when the next procurement comes.

Monitoring aspects, either monitoring of pest infestation or commodity quality have also been implemented, although their SOP are not available yet. Monitoring of insect infestation has been carried out using insect traps, such as bait trap, carton trap and sticky trap. At the time of monitoring, psocid was found, while rat infestation was not found. The results of monitoring will be used to determine control actions such as fumigation and insecticide spraying.

As further action of monitoring results that showed the existence of insect pest infestation, control aspects such as phosphine fumigation and insecticide spraying using cypermethrin have been implemented. Pest control division is available, but fumigation is still carried out by private fumigator. Nevertheless, SOP for pest control is available.

Managerial aspect has been going well, because management side supported much the implementation of ISPM at PT Garudafood. In relation to the management support, internal training on ISPM has been organized on 11 October 2006. The participants consisted of plant managers and factory managers of PT Garudafood.

c. PT Suba Indah Tbk.

Monitoring of ISPM implementation at PT Suba Indah Tbk. was carried out in the warehouse Suba Indah area on 18 September 2006. The warehouse is located in Jl. Raya Anyer – Cilegon Km 9, Kawasan Pelabuhan Khusus, Cigading, Cilegon, Banten province.

PT Suba Indah Tbk. is an enterprise active in dealing with food and fertilizer products. At the beginning the stored commodities were corn, soybean and tapioca flour. The corn was used to prepare corn oil, while the corn starch was used as material for preparing sweetener and liquid fertilizer. Due to the difficulty in obtaining corn, at the time of monitoring the warehouse of PT Suba Indah Tbk. did not store any corn, but it stored tapioca flour as material for preparing sweetener and corn starch for preparing liquid fertilizer. Nevertheless, ISPM has been implemented. PT Suba Indah Tbk has implemented ISO 9001 as much as 70 %.

PT Suba Indah Tbk is located in the area of steel industry. In this area there are various kinds of industries. PT Suba Indah Tbk has problems due to the dust produced by the steel industry. Consequently, this enterprise should increase the operating cost to eliminate the dust.

Pest prevention has not been well implemented yet, because the warehouse was not clean enough. It was probably due to the policy of this enterprise to reduce the number of staff, including the staff who clean the warehouse. The efficiency of staff was probably due to the difficulty in obtaining corn. PT Suba Indah Tbk has already SOP for commodity quality before storage. The rotation of commodity stock has also been implemented using FIFO system.

Monitoring has been implemented by pest control division. Private pest control (Aardwolf) conducted an audit every Monday. The problem encountered was the disturbance of bird, rat and cat. In certain location rat and cat traps were installed. Monitoring of pest using insect traps was not conducted, while monitoring of commodity quality during storage has been conducted. PT Suba Indah Tbk has already SOP for monitoring of pest.

Pest control has been conducted chemically, either using insecticide spraying or phosphine fumigation. The control was carried out by pest control division of PT Suba Indah Tbk. The division has already SOP that arranges the implementation of pest control.

The application of ISPM in PT Suba Indah Tbk is supported by its management side.

d. Perum BULOG Divre South Sulawesi

Monitoring of ISPM implementation at Perum BULOG Divre South Sulawesi has been carried out from 13 to 15 November 2006 coinciding with monitoring to PT Eastern Pearl Flour Mills storage. Monitoring has been carried out at Semi Permanent Storage of Lamajakka I Pinrang, Sub Divre II Parepare, Divre South Sulawesi, Jl. Poros, Parepare – Pinrang.

The Semi Permanent Storage (GSP) of Lamajakka I Pinrang stored milled rice commodity with a capacity of 1000 – 2000 tons. At the time of monitoring, GSP Lamajakka I Pinrang accommodate milled rice stock for 2006. The name of warehouse keeper is Mr. Rahim Karim.

The implementation of ISPM at GSP Lamajakka I Pinrang has been conducted quite well, such as cleanliness of warehouse, warehouse environment as well as number of personnel and equipment used to keep the warehouse clean. This warehouse has been appointed as the winner of the competition on Warehouse and Quality held in the region of Perum BULOG Divre South Sulawesi. The Standard Operating Procedure (SOP) for the quality of the commodity before storing is already available. The supply management for commodities has been implemented according to the regulations i.e. by rotation of commodity supply following the system of first in first out (FIFO). Data on the duration of storing for the stocks of unhulled rice and milled rice should be regularly reported. The FIFO system should be implemented to guarantee the quality of the stored commodity.

The implementation of ISPM from the monitoring or inspection aspect has been conducted in line with SOP for the monitoring of storage pest and commodity quality during storage. Monitoring of pest infestation and commodity quality has been done by using probe or spear sampler. The use of carton trap for monitoring of storage pest population has also been conducted; although the data for threshold guidelines is not yet available and it still need to be studied. Monitoring has been done regularly. At the time of monitoring, no storage pest infestation has been found. There was also no rat infestation.

The control aspect in the implementation of ISPM has been done i.e. chemical control by spraying insecticides and phosphine fumigation. Spraying of insecticides was regularly applied i.e. once a month, but fumigation will be conducted based on the result of pest monitoring in the storage. The official in charge of storage pest management and SOP for storage pest management has been prepared by Perum BULOG.

In the frame of storage management, the warehouse keeper observed that one thing that should be noted is to maintain the cleanliness of the storage and its environment. The following steps should be taken in connection with the cleanliness of the storage and its environment :

- The warehouse keeper should convince the existing manpower to be aware of the importance of cleanliness in connection with the task and function of Perum BULOG
- To prepare cleanliness tools
- Prior to piling up of the commodities, the storage should be cleaned and sprayed with insecticides in order to be free from pests
- The environment surrounding the storage should be also clean to make it comfortable as well as to avoid rodent pest
- Cleaning activities should be regularly carried out.

In general the implementation policy of ISPM at Perum BULOG Divre South Sulawesi is in the right track with the support of the management side.

e. PT Eastern Pearl Flour Mills

Monitoring of ISPM implementation at PT Eastern Pearl Flour Mills has been done from 13 to 15 November 2006. Monitoring has been conducted at Storage A and B of PT Eastern Pearl Flour Mills, Jl. Hatta 32, Makassar.

PT Eastern Pearl Flour Mills is a company dealing with food sector i.e. wheat and its products (wheat flour). Storages owned by this company are in the form of silo for wheat seeds (in bulk) and open storage for storing wheat flour packed in bags made of blue cloth (25 kg per bag). The name of warehouse keeper is Mr. Willy Tulus Wibowo.

The implementation of ISPM has fulfilled the necessary requirements, i.e. not only in the storage but since wheat arrived at the storage, its quality as well as pest and treatment for pest control were inspected.

Prevention aspect was considered sufficient, such as cleanliness of storage, the environment surrounding the storage as well as number of personnel and tools required to keep the storage clean. The SOP for keeping the storage clean is not yet available, but SOP for commodity quality before storing has been prepared. The management for the commodity stock has been implemented quite well i.e. rotation of commodity supply applying the first in

first out (FIFO) system . By applying this system the commodities which first enter the storage will be taken out first and commodities which enter the storage on a later date will be taken out later in order to guarantee the quality of the stored commodity.

The implementation of ISPM from the monitoring or inspection aspect has been done according to the SOP to monitor storage pest and commodity quality during storage. The monitoring of pest infestation has been carried out by using insect trap i.e. sticky trap . At the time of monitoring, *Tribolium* sp. infestation at the container for collection of spilled wheat flour. No rat infestation was found.

The control aspect in the implementation of ISPM has been conducted i.e. chemical control by spraying insecticides and phosphine fumigation. The pest control section under the supervision of the Department of Engineering is responsible for the control of storage pest. However, PT Eastern Pearl Flour Mills has not yet prepared the SOP for storage pest management.

The implementation policy for ISPM at PT Eastern Pearl Flour Mills got good response and support from the management side. This could be concluded from the regular meetings held every Tuesday to evaluate the implementation of ISPM. At the regular meetings, Mr. Eri S. Rilwan, former participant of the Training for Trainers on ISPM is entrusted to chair the meeting.

f. Perum BULOG Divre East Java

Monitoring of ISPM implementation at Perum BULOG Divre East Java, Jl. A. Yani 146 – 148, Surabaya was conducted on 17 November 2006. The monitoring was done at the *Gudang Bulog Baru* (GBB) Buduran II Sub Divre North Surabaya, Jl. Raya Buduran – Sidoarjo.

GBB at Buduran II Sub Divre North Surabaya accommodated milled rice with a storing capacity of 3500 tons. The name of warehouse keeper is Mr. Eko.

The prevention aspect in the implementation of ISPM at GBB Buduran II, Sub Divre North Surabaya, has fulfilled the requirements such as the cleanliness of the warehouse, the environment surrounding the warehouse as well as the number of personnel and the equipments to keep the warehouse clean. GBB Buduran II Sub Divre North Surabaya has the SOP to maintain the warehouse clean and for the commodity quality before storage . The supply management for the commodities has been well implemented i.e. by supply rotation of commodities considering the first in first out (FIFO). Data on storage duration of milled rice and unhulled rice have been regularly reported. By implementing the FIFO system the commodity which first enters the warehouse will be taken out first and the commodity which

enters the warehouse on a later date will be taken out later in order to guarantee the quality of the stored commodity.

Monitoring or inspection has been carried out according to the SOP for monitoring of storage pest and commodity quality during storage. Monitoring of pest infestation and commodity quality was done by using probe or spear sampling. By the time of monitoring at the GBB Buduran II Sub Divre North Surabaya heavy infestation of psocid was found. Infestation of psocid is not considered as an important pest because its existence will disappear by itself, in addition the warehouse keeper commented that the existence of psocid will make milled rice more whiter because the insect will consume remainder pericarp layer of milled rice. Nevertheless, the cleanliness of the warehouse should be managed by removing the psocids. If not managed properly, the population of psocid will increase fastly and its existence causes trouble to the warehouse officials because the storage floor becomes very slippery. Rat infestation was not found. The use of monitoring tools such as insect trap (light trap, bait trap, carton trap and sticky trap) has ever been done during one month, but due to lack of manpower to check the result of using those traps, the activity was discontinued.

The control aspect in the implementation of ISPM has been carried out i.e. chemical control by spraying insecticides and phosphine fumigation. The official in charge of storage pest management and the SOP for storage pest control has already owned by Perum BULOG. Although the monitoring of pest infestation has been regularly done by using probe, but pest control by spraying is still conducted once a month, thus not based on the result of monitoring. In general phosphine fumigation is carried out once in three months.

In general the implementation policy for ISPM at Perum BULOG Divre East Java gets the support from the management side.

g. Perum BULOG Divre East Kalimantan.

Monitoring of ISPM implementation at Perum BULOG Divre East Kalimantan was carried out on 1 and 2 December 2006. Monitoring was done at *Gudang Bulog Baru* (GBB) Balikpapan, Jl. Mayjen Sutoyo, Gunung Malang, Balikpapan.

GBB at Balikpapan stored milled rice with a capacity of 3500 tons. The name of warehouse keeper is Mr. Amat Riyadi. Imported milled rice from Vietnam is accommodated in this storage, because Balikpapan is not a rice producing area, considering the small areas of rice fields found in Balikpapan.

The implementation of ISPM from the preventive aspects such as sanitation of warehouse and its environment has already been conducted, but at the time of monitoring

loading and unloading activities of imported milled rice were going on so the atmosphere became noisy and the condition around the warehouse was not so clean. The SOP to maintain the cleanliness of the warehouse and commodity quality has been prepared. Supply management has also been implemented properly i.e. by supply rotation of commodities applying the first in first out (FIFO) system. Data on the duration of storage of milled rice and unhulled rice stock have been reported regularly. By applying the FIFO system the commodity which first enter the warehouse will be taken out first, therefore the quality of the stored commodity could be maintained.

The implementation of ISPM from the monitoring or inspection aspect has been done in line with the SOP for monitoring storage pest and commodity quality during storage. Monitoring of pest infestation and commodity quality has been conducted using probe or spear sampling. At the time of monitoring, no insect pest and rat infestation was found. The use of monitoring tools such as insect traps (light trap, bait trap, carton trap and sticky trap) has not been done yet. The constraint of using traps is due to lack of personnel in charge of pest observation to count the number of trapped insects which is time consuming, moreover if the population of insects is quite high.

The control aspect in the implementation of ISPM has been conducted i.e. chemical control by spraying insecticides and phosphine fumigation. Officials in charge of storage pest management are available and Perum BULOG has also prepared the SOP. Pest control by regular spraying is still conducted every month, thus not based on monitoring. In addition, fumigation has not been done based on the result of pest monitoring, but regularly still conducted once in three months. Nevertheless monitoring of pest infestation is still regularly conducted using probe.

In general the implementation policy of ISPM at the Perum BULOG Divre East Kalimantan got the support from the management side.

h. Perum BULOG Divre DKI Jakarta

Monitoring of ISPM implementation at Perum BULOG Divre DKI Jakarta, Jl. Perintis Kemerdekaan, Jakarta Timur has been conducted on 12 November 2006. The monitoring was done at the Sunter Timur Warehouse Compound.

Sunter Timur Warehouse Compound consists of 60 *Gudang Bulog Baru* (GBB) buildings and 4 Multi Purpose (MP) Buildings. This warehouse compound is headed by 16 warehouse keepers.

GBB Perum BULOG Divre DKI Jakarta stored milled rice derived from Makassar, because DKI Jakarta is not the self procurement area. The capacity of GBB is 3500 tons, but at Divre DKI Jakarta the quantity of milled rice in the warehouse is not much, because DKI Jakarta only supplies milled rice for the poor family (*raskin*) which is relatively not much.

Monitoring has been conducted at GBB IV/29 which stored milled rice as much as 550 tons with storing duration of 5 months, GBB IV/30 accommodated milled rice as much as 200 tons with storing duration of 1 month and GBB XI/53 stored milled rice as much as 6 tons with storing duration of 11 months.

In general Sunter Timur Warehouse Compound owned by Perum BULOG is in clean condition either the inside around the warehouse. The SOP for storage cleanliness and the standard for commodity quality before storage are available. The FIFO system for supply rotation of commodities has been implemented.

Monitoring of pest population and commodity quality during storage has also been conducted. Monitoring according to SOP of Perum BULOG has been regularly conducted every 15 days. The report on the result of monitoring the commodity quality as well as pest population has been sent regularly every 15 days. Monitoring is conducted by using probe. The use of insect traps has not been implemented because it is still in the stage of socialization, and also due to unavailability of insect traps. At the time of monitoring the implementation of ISPM no storage insect pest has been found.

Perum BULOG Divre DKI Jakarta like other regional divisions owned a Pest and Quality Control (PQC) division, so that pest control actions such as spraying insecticides as well as fumigation has been conducted by that division. Phosphine fumigation has been conducted by Perum BULOG. The use of methyl bromide has been phased out by Perum BULOG and replaced by phosphine.

The implementation of ISPM at Perum BULOG Divre DKI Jakarta got the support from the management side of the company.

Monitoring Form.

Implementation Checklist

Integrated Storage Pest Management

Project on the Phase-Out of the Use of Methyl Bromide in Grain Storage in Indonesia

(In Cooperation with UNIDO, Ministry of Environment of the Republic of Indonesia and SEAMEO BIOTROP)

I. Company Profile

Name of Company Address :

.....

Name of Warehouse/Silo :

Warehouse Keeper/Silo :

Warehouse Location/Silo :

Commodity :

Date of Monitoring :

II. Checklist on the Implementation of Integrated Storage Pest Management

No.	Activities	Checklist
Prevention Aspect		
1.	In your opinion is the warehouse and its environmental surroundings clean enough?	
2.	Are there sufficient personnel in charge of warehouse cleaning ?	
3.	Is the Standard Operational Procedure (SOP) for maintaining the cleanliness of warehouse available ?	
4.	Are warehouse cleaning tools available ?	
5.	Is there a standard for commodity quality before storage ?	
6.	Is there a SOP for commodity quality before storage ?	
7.	Has the rotation of commodity supply been implemented using First in First Out (FIFO) system ?	
Monitoring or Inspection Aspect		
1.	Do they conduct inspection and monitoring of pest infestation while the commodities are in storage ?	
2.	Is there any storage pest infestation found ?	
3.	Is there any rat infestation found ?	
4.	Do they have insect traps which could be used as monitoring tool for pest population ?	
5.	What kind of insect traps do they use ? <ul style="list-style-type: none"> - Light trap - Bait trap - Carton trap - Sticky trap 	
6.	Do they conduct inspection and monitoring on the commodity quality during storage?	
7.	Do they have a Standard Operational Procedure (SOP) to monitor storage pest and commodity quality ?	

No.	Activities	Checklist
Control Aspect		
1.	Do they carried out storage pest control ?	
2.	Do they conduct chemical control ? <ul style="list-style-type: none"> - Spraying - Fogging - Fumigation using phosphine - Fumigation using methyl bromide 	
3.	Do they have a Division in charge of storage pest management ?	
4.	Does the Division for pest control of the company conduct storage pest control activities ?	
5.	Does the company conduct storage pests control through the services of Pest Control Service ?	
6.	Do they have a Standard Operational Procedure (SOP) to control storage pests ?	
Managerial Aspect		
1.	Does the implementation policy of Integrated Storage Pest Management get support from the management side ?	

Notes :

- In the checklist column, please mark \checkmark if the answer is yes and X if the answer is no.
- Please attach the supporting documents for the implementation of Integrated Storage Pest Management (such as SOP document on pest control, cleanliness and quality standard).
- Please attach a brief description on how the management of warehouse cleaning has been carried out.
- Has the company ever conducted a training on Integrated Storage Pest Management? If not yet, is a training on Integrated Storage Pest Management needed and is there any plan to conduct the training?
- How many human resources are in charge of Integrated Storage Pest Management, and is it sufficient? Does the management prepare a plan for the development of implementation of Integrated Storage Pest Management in their company?

b. Unido Mission 2006

Dr. Alessandro Amadio from UNIDO HQ in Vienna visited Indonesia on April 4-7, 2006 to agree in work plan, equipment procurement and to discuss the progress of the project. Dr Alessandro Amadio accompanied by Mr. Nahrudin Alie of UNIDO Jakarta, Mr. Pumama Hidayat (NPC), Ms. Endang of KLH visited some BULOG storage facilities in Karawang (West Java) and Surabaya (East Java), as well as PT Bogasari (wheat milling company) and PT Berdikari (Fumigation Company & Supplier of Phosphine) in Jakarta. The mission found that BULOG as the biggest owner of grain storages have been using phosphine for fumigation instead of MB. Some BULOG storage managers would also like to implement more environmentally friendly method to control storage pests, that is Integrated Storage Pest

Management (ISPM). ISPM was strictly implemented in PT Bogasari, since the company adopted a high sanitation standard. Dr. Alessandro Amadio was also visiting BIOTROP in Bogor to discuss the progress of the preparation of the ISPM training. He was also discussing a plan of equipment procurement, policy and regulation related to MB, and the progress of the project with the KLH officials and NPC. From the discussion with Dr. Alessandro Amadio can be concluded that the project is running in the right track, the government of Indonesia needs working harder in policy and regulation of MB importation and distribution, and suggested BULOG as the biggest grain storage owner select some of their storages as models of grain storages that fully adopt ISPM as an alternative of MB fumigation.

c. Unido Mission 2007

The 2nd UNIDO mission was to identify the potential beneficiaries for the 2nd phase of equipment grants. The mission was done from xx xx to xx xx 2007. The mission delegation consist of Mr. Milan Demko of UNIDO HQ, Mr. Nahrudin Alie of UNIDO Jakarta, Mr. Purnama Hidayat of NPC, and Ms. Endang Pratiwi of KLH. The mission delegation visited

d. A preliminary survey of the use of MB for non-QPS other than grain storage

A preliminary survey of the use of MB in soil was done Cipanas (West Java), Lembang (West java), and Temanggung (Centre Java). In Indonesia, using MB for soil fumigation is strictly prohibited. Since there was unverified information that MB is used in the strawberry plantation and probably potato and tobacco plantations, a preliminary survey was done.

The result of the survey identified that there was not proven that MB is used for soil fumigation in the area of the survey. It is also known that farmers mostly use Furadan 3G for controlling soil pests.

7.2. ADMINISTRATION

A. Funding Disbursements

B. Compaartive Study for UNIDO Methyl Bromide Project and 20th Montreal Protocol and 19th Meeting of Parties

Mission Delegation:

Mr. Purnama Hidayat, National Project Coordinator for the Project of Phase-out of the use of Methyl Bromide in Grain Storage in Indonesia

Ms. Endang Pratiwi, Methyl Bromide focal in Ministry of Environment, Republic of Indonesia

Mr. Mukti Setiarto, Pesticide Commission, Department of Agriculture, Republic of Indonesia

Mr. Nahrudin Alie, National Coordinator UNIDO MP in Indonesia

Date of visit: 14-26 September 2007 (Including Travel time)

Country visited: Canada – Montreal, 15-22 September and Toronto, 22 – 25 September 2007.

Purpose of mission:

- Conduct Comparative Study for UNIDO Methyl Bromide Project (phase-out of the use of Methyl Bromide in Grain Storage).
- Observe the 20th Montreal Protocol anniversary and 19th Meeting of Parties

The mission programme is presented as Annex 1.

A: UNIDO Methyl Bromide PROJECT COMPERATIVE STUDY

Under the arrangement of the Ministry of Environment of Canada, three visits were paid in Montreal and its surrounding and two meetings in Toronto. Below are results of the visits and meetings:

1. PALLETS COMPANY

Name of company:

L.C.N inc.

Description of company:

- The company produces 7000 pellets every day
- The pellets were heat treated to meet ISPM 15

- Never use Methyl Bromide for pallets treatment

Contact persons:

Mr. Leandre Pellerin
Business Development Director

Address:

1180, 243 Rd, PO Box 210
Saint-Felix-de-Kingsey (Quebec)
JOB 2TO
Tel: (819) 848-2521
Fax: (819) 848-2424; Email: leandre.pellerin@lcn-pal.com

Date of visit:

17 September 2007

Information noted:

- The capacity of heat chamber is 1500 pallets
- Fuel for heater is Butane
- Cost for heat treatment is 1 US\$ per pellet
- The temperature for heat treatment is 85°C for 5 hours (in the day)
- The cost of heat treatment is comparable to Methyl Bromide, but more environmental friendly

2. FLOUR MILLS COMPANY

Name of company:

Horizon Milling, A Cargill Foods Affiliate

Description of company:

- The company was build in 1993
- The capacity of milling is 22 MT per hour
- The company export the product to USA

Contact persons:

Mr. Keith R. Bruce

Product Integrity Manager

Address:

2110 rue Notre-Dame Ouest

Montreal, Quebec H3J 1N2

Tel: (514) 939-8054

Fax: (514) 939-1716

Email: keith_bruce@cardgill.com

Date of visit:

19 September 2007

Information noted:

- Have been using Methyl Bromide to fumigate the plant and commodity
- In the process of adopting a new technology to replace Methyl Bromide
- The alternative technology being adopted is a combination of:
 - o Less than 100 ppm of phosphine (Ecofume)
 - o CO₂= 5-9%
 - o Heat not less than 32°C
 - o Exposure time: 24 hours
- They claimed that PH₃ penetration is better than Methyl Bromide
- CO₂ mode of actions:
 - o Increase breathing rate of insects
 - o Dehydration effect to insects (loss of water)
 - o CO₂ poisoning (suffocating) to insects
- They also use heat treatment for structure: 55°C for 24 hours and IPM
- When asked fumigation for documents and museum they suggested to use CO₂ only

3. CANADIAN GRAIN COMMISSION

Name of company/institution:

Canadian Grain Commission

Description of company/institution:

- Certify grain quality (mostly wheat, corn and soybean)
- Capacity 6000 MT/hour
- Run by government

Contact persons:

Mr. Bruno Sauve
Grain Sanitation Officer
Industry Service, Eastern Region

Address:

271-715 Peel Street
Montreal PQ H3C 4L7
Tel: (514) 283-7475
Fax: (514) 283-5050
Email: bsauve@garinscanada.gc.ca

Date of visit:

21 September 2007

Information noted:

- Production of grains in Canada is 25 million tons per year
- All grains for trading must be certify by Canadian Grain Commission
- Certification is needed to protect farmers in trading
- Inspection of grain including:
 - o Quality
 - o Quantity
 - o Infestation of pests
- Grains with insect infestation is tagged (the red tag), so it is must be inspected carefully
- Infested grains are treated with fumigation (mostly with phosphine)

- The CGC is collaboration with Commission Food Inspection Agency

4. DISCUSSION WITH ISPM SPECIALIST and Indonesian Consulate General in Toronto

Name of company/institution:

Steritech, Brand protection Services

Description of company/institution:

- Food safety
- Quality assurance, and
- Pest prevention
-

Contact persons:

Mr. Dean M. Stanbridge, Dipl. PCT
Vice President, Technical Director

Address:

Box 278 STN, Main Milton
Ontario L9T 4N9
Tel: (905) 878-8468
Fax: (905) 878-9223
Email: dean.stanbridge@steritech.com

Date of Visit/Discussion and Location:

24 September 2007 in Indonesian Consulate General of Republic of Indonesia in
Toronto

Information Noted:

- Before Mr. Stanbridge coming, the study tour team have an opportunity to share the Methyl Bromide Phase-out Program to the Consul General and his staff in Toronto
- Mr. Stanbridge shared his experience in Urban IPM and the his project is Latin America
- Mr. Stanbridge mentioned that Indonesia has one of the best IPM program in the stored management and should promote the IPM program to the world
- The challenges are:
 - o Integration of staff and philosophies

- Reducing pesticide/fumigation
- Sanitation/structural improvements
- Equipments improvements
- Procedural and staff changes
- Effective follow-up

B: 20th MONTREAL PROTOCOL AND 19TH MEETING OF THE PARTIES

The mission participated in most of the programs of the 20th Anniversary of the Montreal Protocol and 19th Meeting of the Parties.

Celebration of MP – The celebration was attended by over 1000 participants from 191 member countries including UN agencies and Environmental NGO (E NGO).

Lesson learned in the 20th Anniversary of the Montreal Protocol:

The 20th Anniversary of MP is an occasion to celebrate the collective efforts of international community(government, academia, NGOs, individuals and industry) to save the ozone layer from human destruction.

The MP was signed in 1987, three years after the first Antarctic ozone hole was discovered In 2006 the Antarctic ozone hole was at record 28 million sqs kilometers and still growing Further ozone depletion over the Arctic and the Northern hemisphere is expected due to the effects of global warming on the upper atmosphere

The MP does not mandate the end of consumption of HCFCs in industrialized countries until 2030 and developing countries until 2040

The ozone layer is not expected to fully recover to pre-1970's levels, but it is expected that barring nasty surprises it will sufficiently recover by 2068. So, till the date when CFCs will be fully phased-out, it will have taken 65 years.

In recent years, scientists have become increasingly aware of possible links between ozone depletion and climate change.

The MP main achievement:

Emission of Ozone Depleting Substance (ODS) have been drastically reduced- from almost 1.5 million tons in 1989 to 89 thousand tons in 2005.

The reduction in ODS since 1990 under the Montreal Protocol is equivalent to about 7-12 years of growth in radiative forcing of CO₂ from human activities.

The Multilateral Fund has been disbursing US \$ 2 billions to Article countries, more than 5000 projects approved.

The MP has significantly reduced the amount of ozone depleting substances (ODS)s released into the atmosphere through the global phase-out of chlorofluorocarbons (CFCs) by 2010

Since CFCs are also very potent global warming substances, the protocol has inadvertently also reduced the emission of large amounts of climate warming gases, by an estimated 11 gigatons of CO₂ equivalent a year.

Further MP to concentrate to achieve are:

- (a) Significantly accelerating accelerating the HCFC and MB phase-out regime
- (b) Facilitating the establishment of a global network for recapture and safe destruction of thousand of tones of banked CFCs and HCFCs in foams; and
- (c) Working in cooperation with Kyoto Protocol to reduce and eliminate the use HCFCs

CHAPTER VIII

CONCLUSION

1. In general the project was run very well. All expected results were achieved, even some components had extra achievements (for example in the numbers of training participants and the involvement private companies).
2. BIOTROP was did very well in conducting training, as it was one of the important components. This succes was included good collaboration with BULOG and private companies in supporting the training programs.
3. The training of Integrated Stored Pest Mangement was recognized as one of very succesful beside the training of phosphine fumigation in term of adoption by companies including BULOG. It was considered new knowledges for majority of participants, even though BULOG has actually introduced a kind of program more than 20 years ago.
4. Equipments grants for phosphine fumigation are considered very useful grants by users, especially PH3 meters since so far they never use it. The phosphine concentration in the fumigation used to be estimated by feeling only, but now they can measure it in real time. Light trap, one of equipments for ISPM was considered most effective trap to catch many kind of insect pest in the grain storages.

5. There were some policies and regulations regarding importation, distribution and using Methyl Bromide were discussed. Some of them were import licensing system, quota for importing Methyl Bromide non-QPS and QPS, supervision on distribution and use of Methyl Bromide. One of the most important achievement in this matter was the Decree of Trade Ministry (No 51 - 2007) that Methyl Bromide was banned import for non-QPS since 1 January 2008 as well as regulation in labelling of Methyl Bromide import for QPS purpose. In the decree was mentioned that all Methyl Bromide for QPS purpose must be labelled "FOR QPS ONLY".

APPENDICES