柒、附件目錄

附件 1、4 月 8 日至 12 日會議行程

Five-day plan

DAY ONE: Monday 8 April 2019

Morning	Industry Conference– hosted by OIRSA
Afternoon	Industry Conference– hosted by OIRSA

DAY TWO: Tuesday 9 April 2019

Morning	ICCBA Technical Working Groups
Afternoon	ICCBA plenary session
Evening	Welcome Reception and QRM delegate registration

DAY THREE: Wednesday 10 April 2019

Morning	Quarantine Regulators Meeting – day one
Afternoon	Quarantine Regulators Meeting

DAY FOUR: Thursday 11 April 2019

Morning	Field Trip
Afternoon	Cultural experience
Evening	Official QRM Dinner

DAY FIVE: Friday 12 April 2019

Morning	Quarantine Regulators Meeting – day three
Afternoon	Quarantine Regulators Meeting
Afternoon	ICCBA Steering Committee meeting

附件2、2019年ICCBA產業會議議程

Industry Conference
8 April 2019
Wyndham Panama Albrook Mall
Panama City, Panama

<u>Industry Conference: Monday 8 April 2019</u>		
Time	Agenda item	Topic
08:30am – 09:00am		Arrival tea and coffee
9:00am – 9:30am	*1*	Opening ceremony *Organismo Internacional Regional de Sanidad Agropecuaria*
9:30am – 10:00am	*2*	Keynote speech: National Program “Panama exports”
10:00am – 10:30am	*3*	Australia’s role in promoting biosecurity in trade *Mr Nathan Reid, Australian Department of Agriculture and Water Resources*
10:30am – 11:00am		Morning tea (*Official photo)*
11:00am – 11:30am	*4*	Keynote speech: “Panama – a Biosecure Country”
11:30am– 12:00pm	*5*	Keynote speech: “Importance of Panama in world trade”
12:00pm – 2:00pm		Lunch
2:00pm – 3:00pm	*6*	Irradiation as a quarantine treatment in fresh products *Mr Mohd Ridzuan Ismail and Mr Raúl Rodas* A successful experience in application of irradiation as quarantine treatment in fresh products *Mr. Miguel Zambada, Gateway America*
3:00pm – 3:30pm		Afternoon tea
3:30pm – 4:00pm	*7*	Experience of Panama in capture of methyl bromide in fumigation treatments of Teak (*Tectona grandis*) timbers *Mr. Cesar Maure, OIRSA-Panama SITC Country Manager*
4:00pm – 5:00pm	*8*	Strengthening biosecurity at the Panama airports, using dog units (canine units) *Mr. Jorge Marín, Panama Quarantine Executive Director, Ministry of Agricultural Development*

附件3、第6屆國際貨運生物安全合作協定全體會員大會(plenary session)議程

ICCBA

International Cargo Cooperative Biosecurity Arrangement

ICCBA Technical Working Groups
9 April 2019
Wyndham Panama Albrook Mall
Panama City, Panama

Agenda number	Topic	Person responsible
1	Welcome and Introduction	Chair
2	Action Item Follow Up	Secretariat
3	ICCBA Arrangement	Secretariat
4	ICCBA MB Trial Update	Malaysia & Indonesia
5	Methyl Bromide Schedule	Secretariat
6	Logging methyl bromide readings	New Zealand
7	Draft ISPM on fumigation	New Zealand
8	Heat Treatment Methodology	Australia
9	Alternative Treatment Presentations Sulfuryl Fluoride – Australia Irradiation – OIRSA & Malaysia Phosphine – Chile Cold Treatment – New Zealand	As nominated
10	E-commerce working group	New Zealand
11	Work plan	Secretariat
12	General Business	All
13	ICCBA Steering Committee Meeting Plenary Session	All
14	Meeting Close	Chair
	QRM Welcome reception Miraflores Locks, Panama Canal	OIRSA

附件4、2019年檢疫管理會議議程

QRM
Quarantine Regulators Meeting
Advancing biosecurity systems through a success-oriented plan

10 to 12 April 2019
Wyndham Panama Albrook Mall
Panama City, Panama

Day One: Wednesday 10 April 2019

Time	Agenda item	Topic
08:30am – 09:00am	Arrival tea and coffee	
9:00am – 9:15am	*1a*	Welcoming address *Mr. Efraín Medina Guerra, Organismo Internacional Regional de Sanidad Agropecuaria*
9:15am – 9:45am	*1b*	Welcoming address *Mr Jagtej Singh, Australian Department of Agriculture and Water Resources*
9:45am – 10:00am	*2*	Introduction of New Agricultural Counsellor *Kate Makin, Counsellor (Agriculture) in Mexico*
10:00am – 10:30am	*3*	Trade Facilitation *Melvin Spreij, Standards and Trade Development Facility and Shane Sela, World Bank*
10:30am – 11:00am		Morning tea (*Official photo)*
11:00am – 11:30am	*4*	ePhyto *Christian Dellis, United States Department of Agriculture*
11:30am– 12:00pm	*5*	IPPC Hub Demonstration *Christian Dellis, United States Department of Agriculture*
12:00pm – 12:30pm	*6*	Update on the IPPC's Sea Container Task Force *Shane Sela, World Bank*
12:30pm – 1:30pm	Lunch	
1:30pm – 3:30pm	*7*	Workshop - Innovation and future of biosecurity *Mr Stephen Peios, Australian Department of Agriculture and Water Resources*
3:30pm – 4:00pm	Afternoon tea	
4:00pm – 4:15pm	*8*	OIRSA Regional risk analysis system *Mrs. Nancy Villegas, OIRSA*
4:15pm – 4:30pm	*9*	Mexico sanitary intelligence system *Mr. Rubén Gaona, SENASICA SADER México*
4:30pm – 4:45pm	*10*	Pest and Diseases Image Library (PADIL) *Mr Nathan Reid, Australian Department of Agriculture and Water Resources*
4:45pm – 5:00pm	*11*	The International Biosecurity Intelligence System (IBIS) *Mr Sam Griffiths, Australian Department of Agriculture and Water Resources*

<u>Day Two: Thursday 11 April 2019 – Field Trip</u>		
Time		Activity
6:15am		Departure from Hotel Wyndham for railroad station
7:00am – 9:00 am		Travel to Colon City, at Panama's Atlantic zone
9:00am – 12:00pm		Visit to Manzanillo seaport premises to observe: • sanitation of containers using spraying arches • methyl bromide recapture • fumigation of timber for export • sanitation of vehicles prior to export
12:00pm – 2:00pm		Lunch at Manzanillo International Terminals (MIT)
2:00pm – 6:00pm		Return by bus to Panama City
7:00pm		Official QRM Dinner, hosted by OIRSA

Day Three: Friday 12 April 2019		
Time	Agenda Item	Topic
8:30am – 9:00am		Arrival tea and coffee
9:00am – 9:15am	*12*	Citrus Huanglongbing – its impact on Panama citriculture *Mr. Gaspar Reygosa, Panama Department of Plant Health, Ministry of Agricultural Development (MIDA)*
9:15am – 9:30am	*13*	Panama experiences in control and eradication of the cattle screwworm *Panama Cattle screwworm program*
9:30am – 9:45am	*14*	Guatemala experience in management of pest free areas, with emphasis in *Ceratitis capitate (Medfly)* *Mr. Eduardo Taracena, Vice Ministry of Agricultural Health and Regulations – Ministry of Agriculture, Husbandry and Food (VISAR – MAGA)*
9:45am – 10:00am	*15*	Belize experiences in maintaining its condition as *C. capitata* (Medfly) free country *Mr. Margarito García, Belize Agricultural Health Authority (BAHA)*
10:00am – 10:15am	*16*	Impact of introduction of Medfly into the Dominican Republic and experiences in eradicating an exotic pest *Mrs. Clara Bueno, Plant Health Directorate – Ministry of Agriculture (DSV-MA)*
10:15am – 10:30am	*17*	Experiences in eradication outbreaks of Central American flying locust In Nicaragua *Mr. Freddy Rivera, Institute of Agricultural Protection and Health (IPSA)*
10:30am – 11:00am		Morning tea
11:00am – 11:30am	*18*	Managing the outbreak of Panama TR4 *Mr Nathan Reid, Australian Department of Agriculture and Water Resources*
11:30am – 11:45am	*19*	Experience in management of an invasive species, the African Giant Snail, introduced to the Dominican Republic *Mr. Jesús Martínez, General Directorate of Husbandry - Ministry of Agriculture (DIGEGA-MA)*
11:45am – 12:00pm	*20*	The Costa Rican "Servicio Fitosanitario del Estado" (State Phytosanitary Service), a successful experience in decentralizing inspection services *Mr. Warner Herrera, State Phytosanitary Service – Ministry of Agriculture (SFE-MAG)*
12:00pm – 12:15pm	*21*	Mexico's Inspection System at seaports, airport and land borders *Mr. Rubén Gaona, National Service of Agri-Food Health, Safety and Quality – Secretariat of Agriculture and Rural Development (SENASICA – SADER)*
12:15pm – 12:30pm	22	Biofouling *Mr Stuart Rawnsley, New Zealand Ministry for Primary Industries*
12:30pm – 12:45pm	23	Experience of Panama in forming 'canine brigades' *Mr. Jorge Marín, Executive Directorate of Agricultural Quarantine – Ministry of Agricultural Development (DECA-MIDA)*
12:45pm – 1:45pm		Lunch
1:45pm – 2:15pm	*24*	Implementing border biosecurity for passengers *Mr Kuo-Shiou Huang, Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture*
2:15pm – 2:45pm	*25*	Next generation X-ray and Algorithm Development *Mr Stuart Rawnsley, New Zealand Ministry for Primary Industries*
2:45pm – 3:00pm	*26*	Australia's Incoming Passenger Card Research *Mr Sam Griffiths, Australian Department of Agriculture and Water Resources*
3:00pm – 3:30pm	*27*	Future Air Traveller *Mr Jagtej Singh, Australian Department of Agriculture and Water Resources*

3:30pm – 3:45pm	*28*	Closing remarks *Mr Jagtej Singh, Australian Department of Agriculture and Water Resources*
3:45pm – 4:00pm	Afternoon Tea	
4:00pm – 5:00pm		5th International Cargo Cooperative Biosecurity Arrangement Steering Committee meeting
7:00pm		Farewell dinner at the Wyndham hotel

附件五、**ICCBA**及**QRM**相關會議與會名單

QRM
Quarantine Regulators Meeting
Advancing biosecurity systems through a success-oriented plan

Quarantine Regulators Meeting
Denpasar, Indonesia 9-11 May 2018

Delegate List

Country	Delegate	Position	Organisation
Australia	Mr Dean Merrilees	Assistant Secretary	Department of Agriculture and Water Resources
Australia	Ms Trish Gleeson	Agricultural Counsellor - Jakarta	Department of Agriculture and Water Resources
Australia	Mr Nathan Reid	Director	Department of Agriculture and Water Resources
Australia	Mr Stephen Peios	Assistant Director	Department of Agriculture and Water Resources
Brunei Darussalam	Mrs Sahjarathudor Nurul Maha'ani Mohd Aiani	Head of Animal Biosecurity Unit	Department of Agriculture and Agrifood
Brunei Darussalam	Ms Layla Syaznie Abdullah Lim	Head of Plant Biosecurity Unit	Department of Agriculture and Agrifood
Cambodia	Mr Chea Ho	Technical Officer of Plant Quarantine Office	Plant Protection Saniatray and Phytosanitary Department, General Directorate of Agriculture
Cambodia	Mr Sereivuth Ly	Chief of Plant Quarantine Office	Plant Protection Saniatray and Phytosanitary Department, General Directorate of Agriculture
Chile	Miss Leticia Venegas	Agriculture Engineer	Servicio Agricola y Ganadero
Chile	Miss Andrea Lira	Agriculture Engineer Post-Entry Quarantine Unit	Servicio Agricola y Ganadero
Fiji	Mrs Anei Rurunacagi	Station Supervisor	Biosecurity Authority of Fiji
Fiji	Mr Mohammed Aiyaz	Station Coordinator	Biosecurity Authority of Fiji
Fiji	Mr Nitesh Datt	Acting Chief Plant Protection Officer	Biosecurity Authority of Fiji

Country	Delegate	Position	Organisation
Fiji	Mr Surend Pratap	Manager National Operations	Biosecurity Authority of Fiji
Fiji	Mr Ronald Prasad	Team Leader Trade Facilitation & Compliance	Biosecurity Authority of Fiji
India	Mr Om Prakash Verma	Deputy Director	Department of Plant Protection, Quarantine and Storage
India	Dr Suresh Kumar	Assistant Director (Entomology)	Department of Plant Protection, Quarantine and Storage
Indonesia	Dr Antarjo Dikin	Director, Centre for Plant Quarantine and Biosafety	Indonesian Agricultural Quarantine Agency
Indonesia	Mr Turhadi Noerachman	Head of Division of Plant Quarantine for Plant Product	Indonesian Agricultural Quarantine Agency
Indonesia	Ms Aprida Cristin	Head of Sub Division for Export and Domestic Quarantine	Indonesian Agricultural Quarantine Agency
Indonesia	Mrs Ratih Rahayu	Plant Quarantine Official, Division of Plant Quarantine for Plant Product	Indonesian Agricultural Quarantine Agency
Japan	Mr Kiyofumi Abe	Deputy Director	Ministry of Agriculture, Forestry and Fisheries
Japan	Mr Ryosuke Kimura	Assistant Manager	Ministry of Agriculture, Forestry and Fisheries
Republic of Korea	Mr Mingoo Park	Deputy Director in Plant Pest Control Division	Animal and Plant Quarantine Agency
Laos	Dr Soulaphone Inthavong	Deputy Director General	Department of Agriculture, Ministry of Agriculture and Forestry
Laos	Mrs Thatsanaly Saphangthong	Head of Plant Health Section, Plant Quarantine Division	Department of Agriculture, Ministry of Agriculture and Forestry

Country	Delegate	Position	Organisation
Malaysia	Mr Mohd Ridzuan Ismail	Principal Assistant Director	Plant Biosecurity Division, Department of Agriculture
Malaysia	Mr Abdullah Fauzi Samsudin	Assistant Director	Plant Biosecurity Division, Department of Agriculture
Myanmar	Ms Tin Tin Oo	Staff Officer	Plant Protection Division, Department of Agriculture, Ministry of Agriculture, Livestock and Irrigation
Myanmar	Mr Aung Thu	Staff Officer	Plant Protection Division, Department of Agriculture, Ministry of Agriculture, Livestock and Irrigation
New Zealand	Mr Stuart Rawnsley	Manager North Cargo	Ministry for Primary Industries
New Zealand	Ms Jo-Anne Stokes	Senior Adviser	Ministry for Primary Industries
OIRSA	Mr Raul Antonio Rodas Suazo	Regional Director of Quarantine Services	Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA)
OIRSA	Mr Efrain Medina Guerra	Executive Director	Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA)
Papua New Guinea	Mr Alphonse Bannick	Chief Agriculture Quarantine Officer - Operations	National Agriculture Quarantine and Inspection Authority
Papua New Guinea	Mr Michael Areke	Acting Manager – Compliance	National Agriculture Quarantine and Inspection Authority
Peru	Mr Jose Luis Diaz Zevallos	Plant Quarantine Specialist	Servicio Nacional de Sanidad Agraria
Peru	Mr Ronald Enio Joaquin Quenta	Internal Quarantine Specialist	Servicio Nacional de Sanidad Agraria
Philippines	Mr Glenn Panganiban	Senior Agriculturist/Office-in-Charge, Assistant Chief	National Plant Quarantine Services Division, Bureau of Plant Industry
Philippines	Mr Ricardo (Dudz) Padilla	Officer-in-Charge, Assistant Chief Manila International Container Port Station	National Plant Quarantine Services Division, Bureau of Plant Industry

Country	Delegate	Position	Organisation
Sri Lanka	Mr Nalin Ekanayake Mudiyanselage	Director	National Plant Quarantine Service, Department of Agriculture
Sri Lanka	Mrs Karuna Warshamana	Deputy Director	National Plant Quarantine Service, Department of Agriculture
Standards and Trade Development Facility	Ms Marlynne Hopper	Economic Affairs Officer	Standards and Trade Development Facility
Taiwan	Dr Su-Chin Chen	Section Chief, Plant Quarantine Division	Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture
Taiwan	Mr Kuo-Shiou Huang	Specialist	Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture
Thailand	Mr Chaisak Ringluen	Agriculture Research officer	Department of Agriculture
Thailand	Mr Chamlong Lapasatukul	Agriculture Research officer	Department of Agriculture
Thailand	Mr Wanich Khampanich	Agriculture Research officer	Department of Agriculture
Vietnam	Mr Binh Ngo Tien	Plant Quarantine Official	Plant Protection Department of Vietnam
Vietnam	Mr Quang Luong Ngoc	Plant Quarantine Official	Plant Protection Department of Vietnam
World Bank	Ms Theresa Morrissey	Border and Trade Facilitation Adviser	World Bank

附件6、Irradiation as a quarantine treatment in fresh products

IRRADIATION AS A QUARANTINE TREATMENT

ING. RAUL ANTONIO RODAS & MOHD. RIDZUAN

10-12 APRIL 2019

PANAMA

INTRODUCTION

- Agricultural exports including fresh fruits and vegetables provide important sources of foreign exchange for many countries.
- Fresh fruits and vegetables from distant countries are exported by air/sea/land.
- Since fresh fruits and vegetables are susceptible to insect infestation, the risk of disseminating pests of quarantine importance will be greater due to the short duration before they reach their destination.

- Prior to allowing importation of fresh fruits and vegetables from areas in which quarantine pests i.e. fruit flies are endemic, importing countries would normally require the commodities to be treated by an appropriate disinfestation treatment to kill/prevent adult emergence of specific quarantine pests.

- Several effective quarantine treatments which have been recognized include fumigation, temperature manipulation such as dry heat treatment and refrigeration, modified atmosphere such as vapour heat treatment (VHT), hot water dipping, insecticide dipping and irradiation.
- These treatments can be used singly or combined. In the case of irradiation, earlier only the USA has accepted the technology as a quarantine treatment for papaya originating from Hawaii.

International development of irradiation as a quarantine treatment

- The role of irradiation as a quarantine treatment of fresh fruits and vegetables was first evaluated internationally by a group of experts convened by FAO and IAEA in 1970 (IAEA, 1971).
- In 1984, the International Consultative Group on Food Irradiation (ICGFI) convened a Task Force on Irradiation as a Quarantine Treatment to evaluate available data on radiation sensitivity of **fruit fly species, other arthropod pests** and on **phytotoxicity of commodities** treated for this purpose.
- After evaluation of the available data, the Task Force recommended a minimum generic dose of **0.15 kGy** as a quarantine treatment of fresh fruits and vegetables against **fruit flies** of the Tephritidae family, and **0.30 kGy** against **other arthropod pests** including mango seed weevils (ICCFI, 1986).

- In 1991, the second Task Force of Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables had convened again to evaluate additional data on radiation sensitivity of several more fruit fly species, other insects and mites which were generated by the FAO/IAEA Coordinate Research Commodities carried out between 1986 and 1990 (ICGFI, 1991a).
- The Task Force recognized that enough data existed to establish radiation doses that will meet quarantine security for a number of pest species in various host commodities **(Tables I and II).**

- The Task Force **reaffirmed the earlier recommendations made in 1986** on the acceptance of generic doses of irradiation as a quarantine treatment of fresh agricultural commodities.
- It also stated that **irradiation is an effective broad-spectrum quarantine treatment against various species of fruit flies and other insect pests regardless of the host commodities**.

- The **effectiveness of irradiation** as a broad spectrum **quarantine treatment** of fresh fruits and vegetables **has been recognized** by the regional plant protection organizations which operate within the frame work of the **International Plant Protection Convention (IPPC),** including the North American Plant Protection Organization (**NAPPO**), the European Plant Protection Organization (**EPPO**), the Asia and the Pacific Plant Protection Commission (**APPPC**), the Committee de Sanidad Vegetal del Cono Sur (**COSAVE**) and the Organism International Regional de Sanidad Agropecuaria (**OIRSA**).

- In 1989, the USDA authorized an irradiation dose of 150 Gy for control of fruit fly in Hawaiian papayas intended for movement from the state of Hawaii to the Continental United Stated, Guam, Puerto Rico, and the United States Virgin Islands.

- The ICGFI Working Group on Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables developed a set of principles and guidelines to facilitate acceptance of irradiation as a broad spectrum quarantine treatment of these commodities based on the earlier recommendations including a detailed quality control programme for the packers at irradiation facilities (ICGFI), 1991b).
- The Working Group also prepared action plans to overcome barriers in implementing the use of this technology as a quarantine treatment (ICGFI, 1994).

Irradiation as quarantine treatment

- The purpose of quarantine treatment is to eliminate the risk of pests being transferred through commodities from an area in which they are endemic to an area that is free of the pests.
- Fruit flies (family Tephiritidae) are the most important group worldwide. There are many other insect and mite species of quarantine importance where irradiation is also effective.

Irradiation as quarantine treatment

- Irradiation gives **a level of quarantine security** at doses that do not harm the commodity.
- The **treatment time is very short** and **cannot induce radioactivity** in the products.
- Commodities treated by irradiation are therefore safe for the **consumer**, and the **environmen**t is not affected by the treatment.

Factors Considered for Irradiation Acceptance

- **Effect on Pest Species**
- **Effect on Host Commodities**
- **Economic Benefits of Irradiation**

Effect on Pest Species

- Among a multitude of insect pests of quarantine importance, fruit flies of the family Tephritidae are probably the most important group worldwide. The fruit fly species of major international and quarantine importance are listed in **Table III**.
- Some other pests of major international economic and quarantine importance are listed in **Table IV.**

- It is recognized that irradiation will not be lethal to all adult insects at the time of treatment.
- Therefore, adult sterilization resulting from such irradiation must be considered when establishing criteria for a quarantine treatment.

- Dose of 150 Gy will prevent fruit fly eggs or larvae from completing their development to normal reproductive adults.
- However, for pests other than fruit flies, a dose of 300 Gy will prevent eggs or larvae from completing their development to normal reproductive adults.

Effect on Host Commodities

- Research on various aspects of food irradiation has been conducted for over 40 years.
- Besides research on irradiation of target pests, there have been studies of chemical and metabolic changes and other effects of quarantine significance on the treated commodities.
- Available data (**Table V)** showed that most fruits and vegetables can be irradiated at doses required for quarantine purposes without adversely affecting their quality**.**

- Factors that affect susceptibility of commodities to irradiation are maturity and ripeness.
- Commodity tolerance to radiation stress depends upon cultivar, preharvest factors, climatic conditions and cultural practices and postharvest handling practices.

Economic Benefits of Irradiation

- Irradiation is an effective broad spectrum quarantine treatment for fruits and vegetables, some of which show phytotoxicity to other treatments. It is the only recognized quarantine treatment for mangoes infested by seed weevil.
- Cost benefit estimates on the commercial use of irradiation as a quarantine treatment show that the cost of irradiation is competitive with fumigation and may be less than other physical treatments such as heat or refrigeration.
- A general comparison of costs effectiveness of various commodity treatments is included (**Table VI**).

Approval of irradiated fresh fruits and vegetables.

- The Codex Alimentarius Commission had recommended its member governments to accept all food irradiated with doses up to 10 kGy
- Most governments opted for approval of irradiated food on an item-by-item basis, and occasionally on specific group/classes of food, e.g. more irradiated food items or groups of food for consumption.
- Irradiated fresh fruits and vegetables approved in different countries are shown in **Table VII**. All approvals are given with maximum doses higher that those required for quarantine treatment.

Conclusions

- Irradiation offers a broad spectrum quarantine treatment for most fresh fruits and vegetables without compromising their quality.
- Cost estimates show that irradiation is competitive and often more economical than other residue-free chemical quarantine treatments.
- To demonstrate the efficacy of using irradiation as a quarantine treatment, national authorities and industries are urged to collaborate in conducting transport trials, as well as market studies in potential importing countries

Conclusions

- Irradiation gives **a level of quarantine security** at doses that do not harm the commodity.
- The **treatment time is very short** and **cannot induce radioactivity (although at high dose)** in the products.
- Commodities treated by irradiation are therefore safe for the **consumer**, and the **environmen**t is not affected by the treatment.

Recommendations

- The **governments and industries** interested in irradiation as a quarantine treatment are urged to **develop quality assurance programs** comprising the growing, harvesting, packing, handling, transport, treatment, storage, and marketing of their commodities.
- These authorities should promote the **proper use of inspection and certification procedures** to assure the effective use of irradiation as a quarantine treatment.
- A rapid, practicable technique should be **developed to decide/detect whether insects have been irradiated.**

References

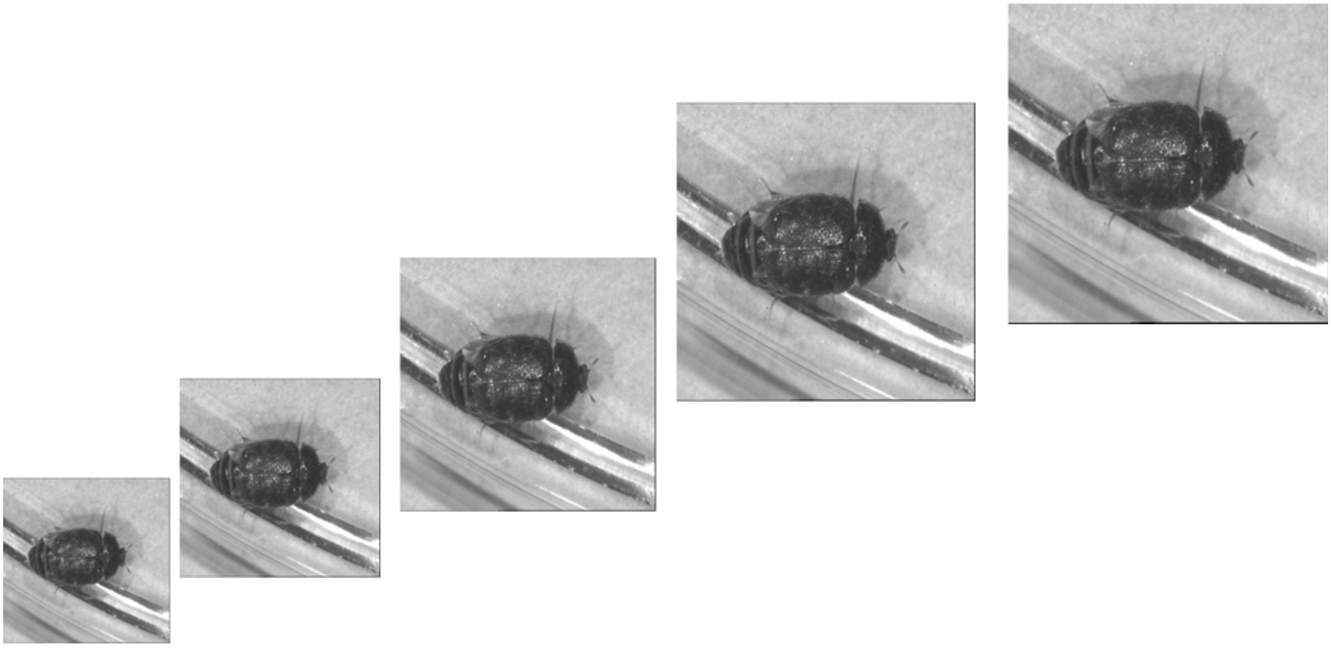
- IAEA 1971 Disinfestation of Fruit by Irradiation. Proceedings of Panel of Experts, Honolulu, Hawaii, 1970, IAEA Vienna
- ICGFI 1986 Report of the Task Force Meeting on Irradiation as a Quarantine Treatment, convened by the International Consultative Group on Food Irradiation (ICGFI), Chiang Mai, Thailand, IAEA, Vienna.
- ICGFI 1991a Report of the ICGFI Task Force on Irradiation as a Quarantine Treatment Fresh Fruits and Vegetables, Bethesda, Maryland. ICGFI Document 13, IAEA Vienna.
- ICGFI 1991b Code of Good Irradiation Practice for Insect Disinfestation of Fresh Fruits. ICGFI Document 7. IAEA Vienna.
- ICGFI 1994 Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables, report of the working group convened by ICGFI, Washington DC ICGFI Document 17. IAEA Vienna
- ICGFI 1995 ASEAN/ICGFI Seminar on Food Irradiation, Jakarta, Indonesia. ICGFI Document 22. IAEA Vienna

EFFECT OF IRRADIATION ON DIFFERENT DEVELOPMENTAL STAGES OF KHAPRA BEETLE LIFE CYCLE

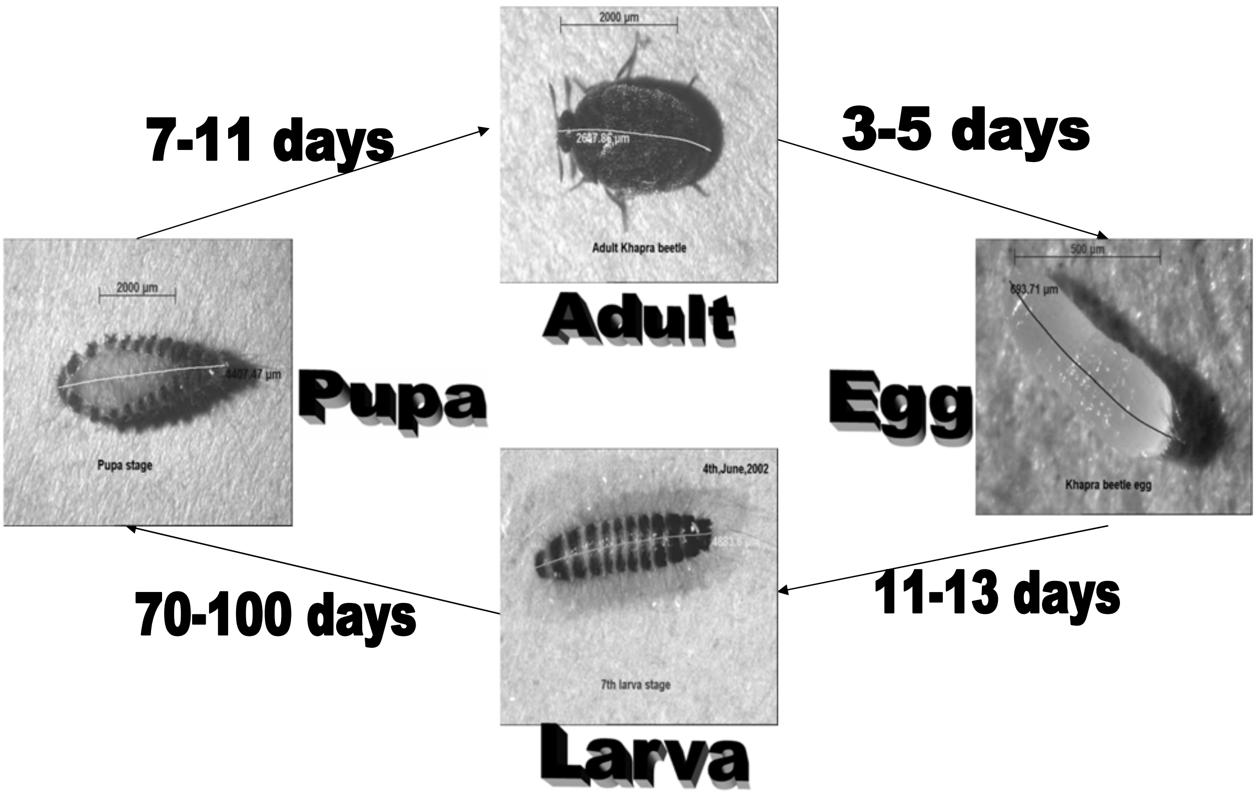
Introduction

Trogoderma granarium Everts is a very destructive pest of stored grain throughout the tropics and subtropics.
International trade has spread this pests to storage facilities in many temperate countries.

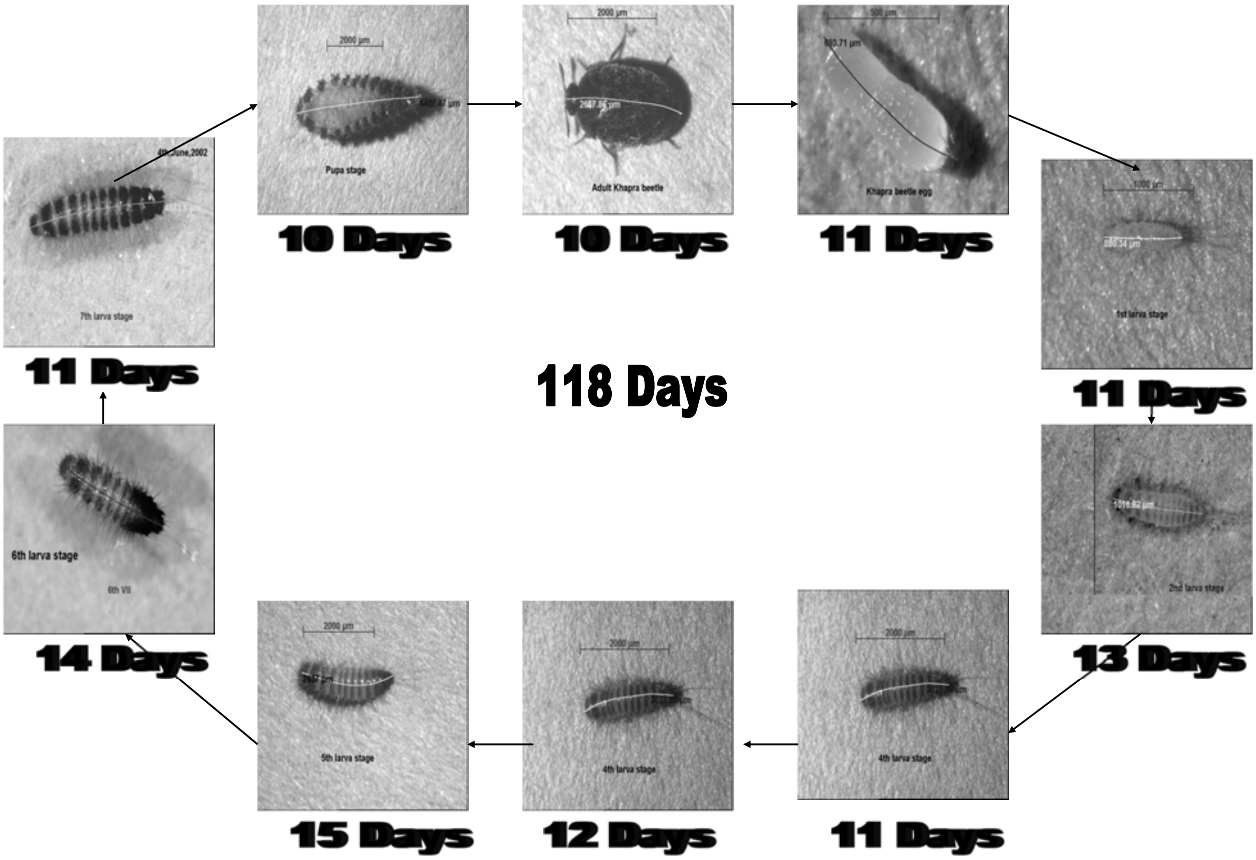
LIFE CYCLE OF KHAPRA BEETLE



Life Cycle of Khapra Beetle



Detailed life cycle of khapra beetle



Effect of Gamma Irradiation on different developmental stages of Khapra Beetle,

Trogoderma granarium Everts

Gamma-Rays

- The term gamma ray is used to denote electromagnetic radiation from the nucleus as a part of a radioactive process.

- The gamma ray photon may in fact be identical to an x-ray, since both are electromagnetic rays; the terms x-ray and gamma rays are statements about origin rather than implying different kinds of radiation.

- Frequencies: typically >1020 Hz
- Wavelengths: typically < 10-12 m
- Quantum energies: typically >1 MeV

Eg: Source Cobalt 60

Experiment on eggs

Dose (Gy)	No. of eggs	Eggs to larvae	Eggs to pupae	Eggs to adults
0	165	56	56	56
100	213	28	0	0
200	264	11	0	0
300	157	0	0	0

Experiment with larvae

Dose (Gy)	No. of larvae	larvae stages	larvae to pupae(%)	larvae to adult(%)	Complete mortality (Days)
0	50	1st stage	41 (82)	40 (80)	-
0	50	2nd stage	44 (88)	42 (84)	-
0	50	3rd stage	47 (94)	45 (90)	-
0	50	4th stage	49 (98)	48 (96)	-
0	50	5th stage	47 (94)	47 (94)	-
0	50	6th stage	48 (96)	47 (94)	-
0	50	7th stage	48 (96)	48 (96)	-
0	50	8th stage	49 (98)	48 (96)	-

Experiment with larvae

Dose (Gy)	No. of larvae	larvae stages	larvae to pupae(%)	larvae to adult(%)	Complete mortality (Days)
100	50	1st stage	0	0	82
100	50	2nd stage	0	0	98
100	50	3rd stage	0	0	100
100	50	4th stage	0	0	-
100	50	5th stage	0	0	-
100	50	6th stage	0	0	-
100	50	7th stage	0	0	-
100	50	8th stage	4 (8)	0	-

Experimewnt with larvae

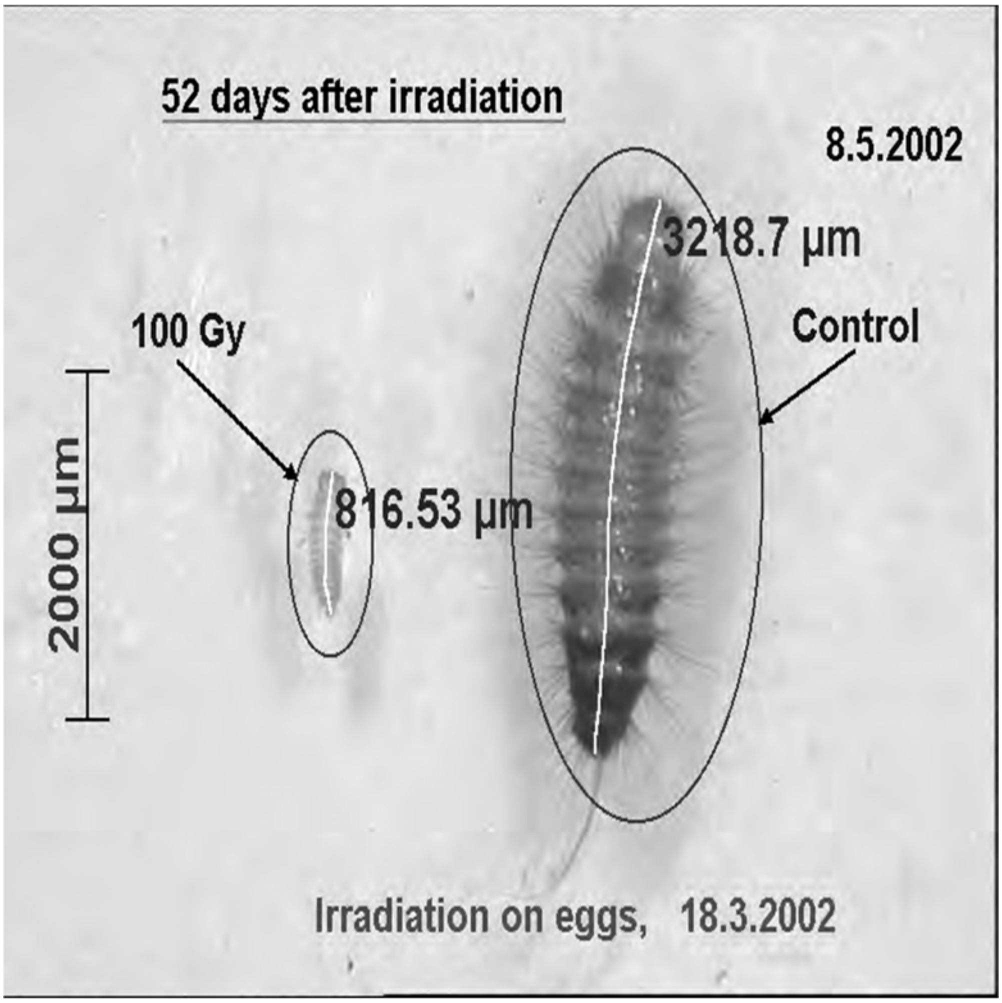
Dose (Gy)	No. of larvae	larvae stages	larvae to pupae(%)	larvae to adult(%)	Complete mortality (Days)
200	50	1st stage	0	0	84
200	50	2nd stage	0	0	97
200	50	3rd stage	0	0	99
200	50	4th stage	0	0	97
200	50	5th stage	0	0	98
200	50	6th stage	0	0	98
200	50	7th stage	0	0	99
200	50	8th stage	1 (2)	0	103

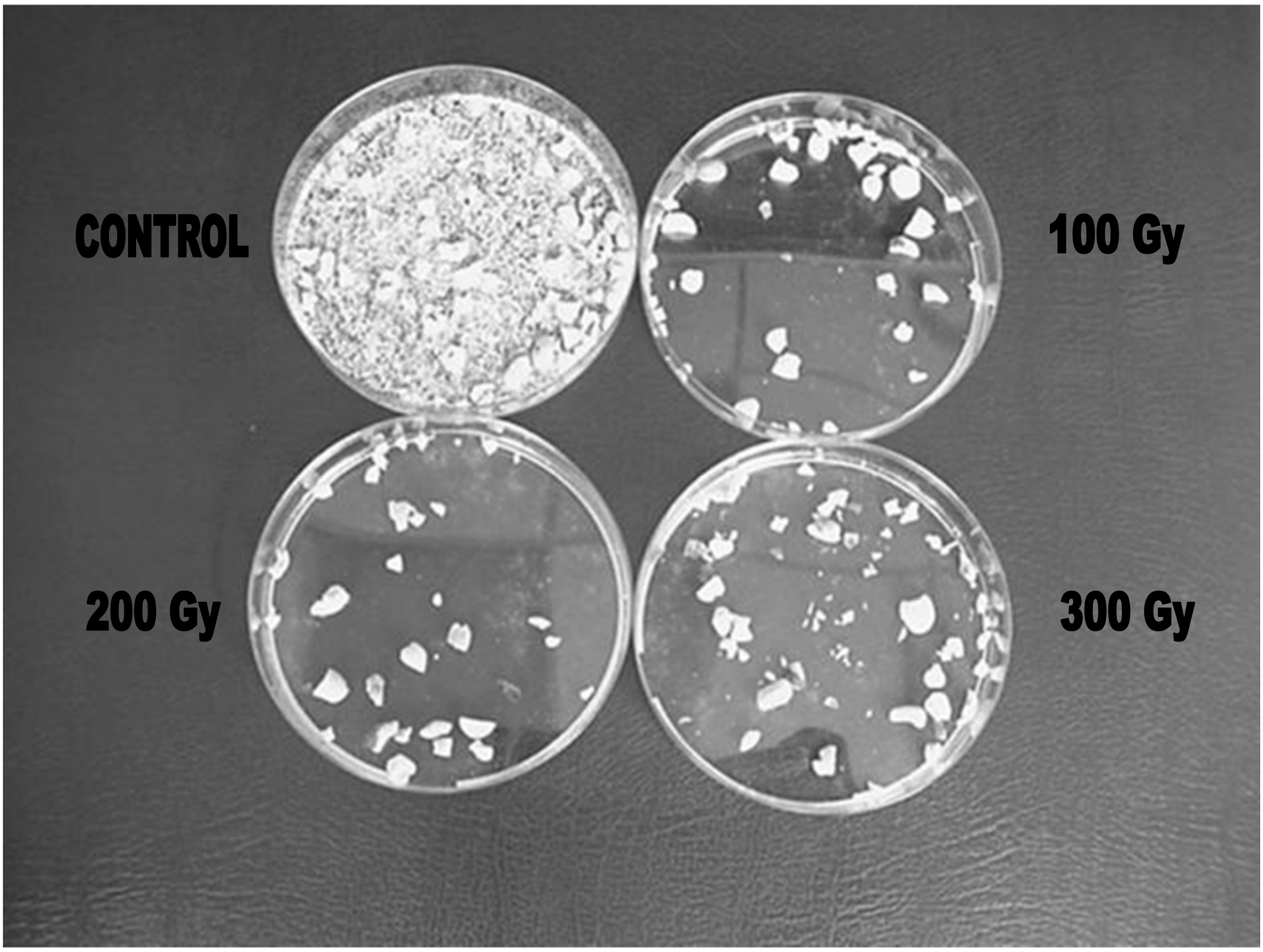
Experiment with larvae

Dose (Gy)	No. of larvae	larvae stages	larvae to pupae(%)	larvae to adult(%)	Complete mortality (Days)
300	50	1st stage	0	0	75
300	50	2nd stage	0	0	96
300	50	3rd stage	0	0	97
300	50	4th stage	0	0	97
300	50	5th stage	0	0	97
300	50	6th stage	0	0	98
300	50	7th stage	0	0	98
300	50	8th stage	1 (2)	0	103

Experiment on pupae

Dose (Gy)	No. of pupae	Pupae to adult	Eggs viability(%)
0	50	47	100
100	50	45	0
200	50	44	0
300	50	42	0





Thank you

Table I : Research studies on effects of exposure of fruit fly larvae to gamma radiation on prevention of subsequent adult emergence

Species	Reference	Age of larvae (instar)	Host	Dose (Gy)	Number tested [1]	Adults emerged (number)	Control emerged (%)
Anastrepha ludens	[20]	Mature	Grapefruit	50	277	0	62.8
	[51]	3rd	Mango	60	5,513	0	84.3
Anastrepha obliqua	[51]	3rd	Mango	60	4,194	0	83.5
Anastrepha serprentina	[51]	3rd	Mango	60	4,025	0	88.6
Anastrepha suspensa	[21]	Mixed	Grapefruit	100	831	0	NR
	[22]	Mixed	Grapefruit	154	9,209	0	NR
	[22]	Mixed	Grapefruit	302	4,840	1*	NR
	[22]	Mixed	Grapefruit	172	749	0	NR
	[22]	Mixed	Grapefruit	172	3,368	1**	NR
	[83]	Mixed	Grapefruit	225	1,966	1**	NR
	[29]	Mixed	Grapefruit	40	3,808	0	NR
	[23]	Mixed	Florida mango	30	8,432	0	NR
	[23]	Mixed	Haitian Mango	55	25,363	2*+1	NR
	[23]	Mixed	Haitian Mango	80	2,961	1*	NR
	[28]	Mixed	Carambola	50	6,423	0	NR
Bactrovera cucurbitae	[24]	Mixed	Mixed fruit	10kR	18,000	2 [2/]	NR
Bactrocera dorsalis	[24]	Mixed	Mixed fruit	10kR	74,000	2	NR
	[25]	6 day	Mango	250	NA	0	NR
	[53]	3rd	Carambola	80	1,432	1**	90.7
	[54]	Mature	Mango	100	12,789	0	96.6
	[57]	3rd	Mango	20kR	NA	31.5%	76.0
Bactrocera tryoni	[36]	Old	Apple	40	3,840	4	68
	[36]	Old	Orange	45	3,400	0	71
	[18]	Young	Avocados	50	20,373	0	NR
	[18]	Young	Oranges	50	9,915	0	NR
	[18]	Old	Avocados	75	20,015	0	NR
	[18]	Old	Oranges	75	4,705	0	NR
	[34]	Young	Mango	50	681	0	NR
	[34]	Young	Tomato	50	11,383	0	NR
	[34]	Young	Cherry (Sup)	75	2,898	0	NR
	[34]	Old	Mango	75	504	0	NR
	[34]	Old	Tomato	75	2,891	0	NR
	[34]	Old	Cherry (Sup)	75	1,484	0	NR
	[59]	3rd	Cherry (Rons)	75	1,080	0	95.8
	[27]	Old	Apples	75	11,863	0	NR
	[56]	7 day	Oranges	75	4,705	0	NR
Bactrocera zonatus	[19]	Mature	Guava	5.5kR	1,202	0	89.7
Ceratitis capitata	[24]	Mixed	Papaya	10kR	1,300	0	NR
	[51]	3rd	Mango	60	4,450	15*	90.4
	[51]	3rd	Mango	80	5,146	8*	90.4
	[51]	3rd	Mango	100	8,536	8*	90.4
	[51]	3rd	Mango	120	5,806	6*	90.4
	[51]	3rd	Mango	150	5,268	5*	90.4

Species	Reference	Age of larvae (instar)	Host	Dose (Gy)	Number tested [1]	Adults emerged (number)	Control emerged (%)
	[51]	3rd	Mango	250	5,192	0	90.4
Rhagoletis cerasi	[17]	Mixed	Cherries	100	299	0	NR
Rhagoletis indifferens	[35]	Mixed	Cherries	18	580	0	35.5

NR Data not reported for emergence of adults in the controls

[1]/ Number tested based on number of larvae if known, otherwise on number of pupae collected from control or treated fruit

[2]/ Two Medflies emerged from fruit infested with melon fly larvae

* Died/No reproduction

** Abnormal

Table II : **Results of confirmatory test on the effects of exposure of fruit fly larvae to gamma radiation on prevention of subsequent adult emergence**

Species	Reference	Age of larvae (instar)	Host	Dose (Gy)	Number tested [1]	Adults emerged (number)
Anastrepha ludens	[51]	3rd	Mango	100	101,794	0
Anastrepha obliqua	[51]	3rd	Mango	100	100,400	0
Anastrepha serpentine	[51]	3rd	Mango	100	105,252	0
Anastrepha suspense	[23]	Mixed	Florida mango	50	64,668	2*
	[28]	Mixed	Carambola	50	100,000	0
Bactrocera cucurbitae	[75]	Mixed	Eggplant	214	201,940	0
	[75]	Mixed	Bell pepper	209	169,903	0
	[75]	Mixed	Papaya	218	20,834	0
	[75]	Mixed	Papaya	225	2,971	0
	[75]	Mixed	Papaya	244	9,011	0
	[75]	Mixed	Papaya	246	22,685	0
	[75]	Mixed	Papaya	246	15,618	0
	[75]	Mixed	Papaya	246	37,956	0
Bactrocera dorsalis	[55]	5 day	Mango	150	173,042	1
	[53]	3rd	Carambola	150	18,000	0
	[54]	5 day	Mango	100	180,082	0
	[75]	Mixed	Bell pepper	209	29,265	0
	[75]	Mixed	Papaya	214	155,963	0
	[75]	Mixed	Papaya	218	73,618	3
	[75]	Mixed	Papaya	225	76,850	2
	[75]	Mixed	Papaya	244	130,156	17
	[75]	Mixed	Papaya	246	14,705	0
	[75]	Mixed	Papaya	246	80,285	0
	[75]	Mixed	Papaya	246	16,115	0
	[75]	Mixed	Papaya	252	149,028	0
	[75]	Mixed	Papaya	291	101,801	0
Bactrocera jarvisi	[60]	5 day	Mango	101	153,814	0
Bactrocera tryoni	[34]	Old	Oranges	75	220,328	0
	[34]	Old	Avocados	75	213,638	0
	[34]	Old	Apples	75	128,373	0
	[60]	5 day	Mango	101	138,635	0
	[27]	Old	Apples	75	262,186	0
Ceratitis capitata	[51]	3rd	Mango	150	100,854	0
	[75]	Mixed	Bell pepper	209	1,430	0
	[75]	Mixed	Papaya	218	70,441	0
	[75]	Mixed	Papaya	225	110,772	2
	[75]	Mixed	Papaya	244	14,844	0
	[75]	Mixed	Papaya	246	15,634	0
	[75]	Mixed	Papaya	246	23,670	0
	[75]	Mixed	Papaya	246	19,335	0
	[75]	Mixed	Papaya	291	73,766	0
Rhagoletis indifferens	[35]	Mixed	Cherries	97	84,368	1*

1/ Number tested based on number of larvae if known, otherwise on number of pupae collected from control or treated unit

* Vestigial wings, failed to emerge from pupation, or other abnormalities

Table III – Fruit fly species of Major International and Quarantine Importance

Scientific Name	Common Name	Primary Economic Hosts	Geographic Orgin
Anastrepha fracterculus	South American fruit fly	Citrus, mango, other fruits	Mexico to South America
Anastrepha grandis	South American fruit fly	Cucurbit	South America, Panama, Mexico, USA
Anastrepha ludens	Mexican fruit fly	Citrus, mango, soft fruits	Mexico, Central America, USA
Anastrepha obliqua	West Indian fruit fly	Mango, guava, spondias	Caribbean, Mexico to South America, USA
Anastrepha striata	Guava fruit fly	Guava, cucurbit	Mexico to South America
Anastrepha suspense	Carribbean fruit fly	Guava, rose apple Euqenia, citrus	Greater Antilles, Florida
Ceratitis capitate	Mediterranean fruit fly	Citrus, most fruits	Africa, Asia Central and South America, Europe, USA, Belize
Ceratitis cosyra	Natal fruit fly	Soft fruits, citrus, coffee	Africa
Dacus cucurbitae	Melon fly	Cucurbits, most fruits, legumes	Africa, SE Asia, Pacific Islands
Dacus dorsalis	Oriental fruit fly	Citrus, most fruits	SE Asia, Pacific Islands
Dacus oleae	Olive fruit fly	Olive	Europe, Africa, W.Asia
Dacus passiflorae	Fiji fruit fly	Citrus, mango, guava, peach, fig	Fiji, Indonesia, Malaysia, Japan, Philippines, Pakistan, Thailand
Dacus tryoni	Queensland fruit fly	Citrus, most fruits	Australia, French Polynesia
Dacus tseneonis	Japanese orange fly	Citrus	Japan, China
Dacus zonatus.	Peach fruit fly	Citrus, mango, guava, peach, fig	SE Asia
Dacus spp	Carambola fruit fly	Various fruits	Suriname
Myiopardalis pardalina	Baluchistan melon fly	Melons	SW Asia
Rhagoletis cingulata	European cherry fruit fly	Cherries, honey-suckle, soft fruits	Europe
Rhagoletis cingulate	Eastern (USA) cherry fruit fly	Cherry, prunus spp.	USA, Canada
Rhagoletis complete	Walnut Husk fly	Walnut	USA, Canada
Rhagoletis fausta	Black cherry fruit fly	Cherry	USA, Canada
Rhagoletis indifferens	Western (USA) cherry fruit fly	Cherry	USA, Canada
Rhagoletis indifferens	Western (USA) cherry fruit fly	Cherry	USA, Canada
Rhagoletis pomonella	Apple moggot	Apple	USA, Canada
Dacus oleae	Olive fruit fly	Olive	Mexico

Table IV : Some other Pests of Major International Economic and Quarantine Importance*

Scientific Name	Common Name	Primary Economic Hosts	Geographic Origin
Anarsia lineatella	Peach twig borer	Peach	Europe, Asia, Africa, Canada, USA
Cryptophle bia leucotreta	False codling moth	Cotton, coffee, deciduous fruit, mango, guava	Africa
Cydia molesta	Oriental fruit moth	Peach, other deciduous fruits	North and South America, Asia, Europe
Cydia fenubrana	Plum fruit moth	Prunus spp	Europe, Cyprus, Algeria, Iran, Syria, Turkey, China
Epiphyas postvittana	Light brown apple moth	Deciduous fruit, apple, pear	Australia, Hawaii, New Caledonia, New Zealand, UK
Lobesia botrana	Grape moth	Grapes, prunus spp	Europe
Praya cirti	Citrus flower moth	Citrus	Europe, Asia, Africa
Sternochetus mangiferae	Mango seed weevil	Mango	Asia, Africa, Australia, Pacific Islands, West Indies
Helipus lauri	Avocado seed weevil	Avocado	Mexico, Central America
HENIPTERA-HOMOPTERA			
Aleurocanthus woqlumi	Citrus black fly	Citrus, ornamentals	Mexico, Asia, Florida, South and Central America, West Indies, Africa
Quadraspidiotus perniciosus	San Jose scale	Apple, pears, grapes, other fruits	North America, Asia, Europe, Africa, Australia
Pseudococcus spp.	Mealy bugs	Citrus, ornamentals	Various
DIPTERA			
Liriomyza trifolii	American serpentine leaf miner	Chrysanthemum, cypsophila, tomato, cucurbits	North America, Europe, South and Central America, Africa, Caribbean, Asia
THTSANOPTERA			
Calipthrips fasiatus	Bean Thrips	Beans	North America, Europe

* Taken from Task Force Meeting on Irradiation as Quarantine Treatment, International Consultative Group on Food Irradiation, Chiang Mai, Thailand, 1986, as amended after ICGFI meeting in January 1991, Bethesda, Maryland USA.

Table V : Response of fruits and vegetables to irradiation treatment with respect to damage

Commodity	Dose (kGy)	Damage	Reference
Apple	0.05-03	No	Angerilli & Fitzfibbon (1990)
Apple	0.2-1.0	No	Olsen et al (1989)
Avocado	0.03-0.5	Yes	Akamine & Goo (1971)
Avocado	0.25	Yes	Balock et al. (1966)
Avocado	0.1	Yes	Jessup et al. (1966)
Banana	0.5	No	Balock et al. (1966)
Banana	0.5	No	Ferguson et al (1966)
Blueberry	0.5	Yes	Thomas et al. (1971)
Blueberry	0.25-1.0	Yes	Baton et al. (1970)
Caramboa	1.0	No	Miller et al. (1994)
Caramboa	1.0	No	Gould & von Windeguth (1991)
Cherry, sweet	0.05-05	Yes	Vijaysegaran et al. (1992)
Cherry. Sweet	>0.2	Yes	Eaton et al (1970)
Cucumber	1.0	No	Jessup (1990)
Cranberry	0.3	No	Jessup et al. (1992)
Grape	0.975-1.0	No	Balock et al. (1966)
Grapefruit	0.5-0.79	No	Eaton et al. (1970)
Grapefruit	1.0	Yes	Maxie et al. (1964)
Grapefruit	1.0	Yes	Dennison et al. (1966)
Grapefruit	0.15-0.3	No	Hatton el al. (1982)
Lemon	0.25	No	Lester & Wolfnbarger (1990)
Lemon	0.05	No	Von windeguth & Gould (1990)
Lemon	0.075-1.0	Yes	Jessup et al. (1992)
Lychee	0.5-1.0	Yes	Maxie et al. (1969)
Lychee	0.75-1.0	No	Moy & Nagai (1985)
Lychee	0.5	No	Balock et al (1966)
Mango	0.075-1.0	No	Jessup et al. (1992)
Mango	0.5	No	McLauchlan et al. (1992)
Mango	0.075-1.0	Yes	Akamine & Goo (1971)
Mango	0.75	Yes	Balock et al (1966)
Mango	0.75	No	Beyers et al (1979)
Mango	0.25-0.75	No	Blakesley et al (1979)
Mango	1.0	Yes	Burditt et al (1981)
Mango	0.1-1.0	No	Bustos et al (1992)
Mango	0.6	Yes	Hatton et al (1961)
Mango	0.1-0.25	No	Mitchell et al (1990)
Mango	>0.25	No	Manoto et al. (1992)
Mango	0.75	Yes	Spalding & voa windeguth (1988)
Mango	0.75	No	Thomas & Beyer (1979)
Nectarine	1.0	No	Vijaysegaran et al (1992)
Nectarine	0.3-1.0	Yes	Jessup et.al (1988)
Orange	0.5-075	No	Moy & Nagai (1985)
Orange	1.0	No	Moy et al. (1992)
Orange	0.225-0.3	Yes	Dennisson et.al (1966)
Orange	1.0	No	Jessup et al. (1992)
Orange	1.0	No	Kahan & Monselise (1965)
Passion fruit	0.75-1.0	Yes	Maxie et al. (1969)
Papaya	0.5-0.75	No	Moy & Nagai (1985)

Commodity	Dose (kGy)	Damage	Reference
Papaya	0.25-1.0	No	Moy et al. (1992)
Papaya	1.0	No	Akamine & Goo (1971)
Papaya	1.0	Yes	Akamine & Goo (1971)
Papaya	0.75	No	Balock et al. (1966)
Papaya	0.75	No	Beyers et al (1979)
Papaya	0.25-1.0	No	Bla kesley et al (1979)
Papaya	0.5-0.75	No	Moy & Nagai (1985)
Papaya	0.75	No	Moy et al. (1992)
Papaya	0.3	No	Thomas & Beyer (1979)
Peach	0.3-1.0	No	Vijaysegaran et al (1992)
Peach	0.5-0.75	No	Moy & Nagai (1985)
Pepper, red	0.3	No	Moy et al. (1992)
Plum	0.3-1.0	No	Mitchell et al (1990)
Plum	0.5-0.75	No	Moy & Nagai (1985)
Sour sop	0.1-1.0	Yes	Akamine & Goo (1971)
Tomato	1.0	No	Abdel-Kader et al. (1988)
Tomato	0.25-1.0	No	Balock et al (1966)

Table VI : General Comparison of Quarantine Disinfestation Treatments

Treatment	Cost Competitivenes	Effectiveness on Quarantine Pests	Logistics	Tolerance of Host Commodities	Residues	Remarks
Irradiation	Good	Excellent	Fair	Very good	Nil	Only method available for mango seed weevil
Vapour Heat	Fair	Mainly fruit flies	Fair	Good	Nil	
Hot Air	Fair	Mainly fruit flies	Fair	Good	Nil	
Hot water	Good	Mainly fruit flies	Good	Good	Nil	
Cold Air	Poor	Good	Good	Fair	Nil	
Fumigation	Good	Good	Very good	Very good*	Yes	

Table VII : Some potential applications and limitations of the use of ionizing energy in the processing of fresh fruits and vegetables

Commodities	Treatment objective	Estimated minimum doses required kilogray	Estimated maximum doses tolerated kilograys	Detrimental effects above maximum dose tolerated	Alternative treatments available
Potato, onions, garlic, carrot, table beet, radish, turnip, Jerusalem artichoke, sweet potato yam, cassava, taro, ginger	Inhibition of growth (sprouting and rooting)	0.05-0.10	0.15	Decreased wound heating ability * Tissue discolorations Increase susceptibility to decay	Use of sprout inhibitors (e.g. maleic hydrazide and chloro isopropyl carbamate) Maintenance of optimum temperature and relative humidity
Asparagus	Inhibition of growth (elongation and curvature)	0.05-0.10	0.25	Tissue breakdown Increase susceptibility to decay	Vertical packing and maintenance of optimum temperature (360F, 20C) and relative humidity (95.98%). Use of elevated carbon dioxide atmospheres
Mushroom	Inhibition of growth (cap opening and elongation) Reduce discoloration	0.06-0.50	1.0	Development of effluvious	Prompt cooling and maintenance of optimum temperature (360F, 20C) and relative humidity (95.98%)
Artichoke, asparagus, brussels sprouts, cabbage, cauliflower, lettuce, spinach, other leafy vegetables	Insect disinfestation (prevention of adult emergence)	0.15-0.30	0.25	Loss for green color Steam pitting of artichoke Tissue discoloration	Fumigation with hydrogen cyanide (can be detrimental to quality of most commodities in this group)

Commodities	Treatment objective	Estimated minimum doses required kilogray	Estimated maximum doses tolerated kilograys	Detrimental effects above maximum dose tolerated	Alternative treatments available
Soap beans, sweet corn, cucumber, egg-plant, okra, green peas, bell peppers, summer squash	Insect disinfestation	0.15-0.30	0.50	Loss of green color Increased derating of sweet cora Tissue discoloration	Fumigation with methyl bromide (can be detrimental to quality)
Cantaloupe, honeydew melons, Persian melon, casaba melons, tomatoes	Insect disinfestation	0.15-0.30	1.00	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be detrimental) Short vapor heat treatment
Apple, apricot, blueberry, cherry, fig, loquat, nectarine, peach, pear, persimmon, plum, pomegranate, raspberry, strawberry, tomatillo	Insect disinfestation	0.15-0.30 depending on the commodity	0.50-1.75	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be determined) Cold treatments
	Control of postharvest molding	1.50-2.00	3.0		Use of postharvest fungicides
Banana, mango, papaya, pineapple, plantain, guava, lychee, longan, rambutan, cherimoya, carambola, sass ion fruit, sapodilla	Insect disinfestation	0.15-0.30	0.50-1.50 depending on the commodity	Accelerated softening Uneven ripening Tissue discoloration	Hot water or vapor heat treatments Fumigation with methyl bromide (can be determined)
	Retardation of ripening	0.25-1.0			Temperature management Ethylene removal Controlled atmospheres

* This is a problem only for wounds that are made after processing. Prior wounds can be allowed to heal before processing.

Source : Anonymous. Ionizing energy in food processing and pest control: Task Force Report No. 115, June, 1989.

Table III – Fruit fly species of Major International and Quarantine Importance

Scientific Name	Common Name	Primary Economic Hosts	Geographic Orgin
Anastrepha fracterculus	South American fruit fly	Citrus, mango, other fruits	Mexico to South America
Anastrepha grandis	South American fruit fly	Cucurbit	South America, Panama, Mexico, USA
Anastrepha ludens	Mexican fruit fly	Citrus, mango, soft fruits	Mexico, Central America, USA
Anastrepha obliqua	West Indian fruit fly	Mango, guava, spondias	Caribbean, Mexico to South America, USA
Anastrepha striata	Guava fruit fly	Guava, cucurbit	Mexico to South America
Anastrepha suspense	Carribbean fruit fly	Guava, rose apple Euqenia, citrus	Greater Antilles, Florida
Ceratitis capitate	Mediterranean fruit fly	Citrus, most fruits	Africa, Asia Central and South America, Europe, USA, Belize
Ceratitis cosyra	Natal fruit fly	Soft fruits, citrus, coffee	Africa
Dacus cucurbitae	Melon fly	Cucurbits, most fruits, legumes	Africa, SE Asia, Pacific Islands
Dacus dorsalis	Oriental fruit fly	Citrus, most fruits	SE Asia, Pacific Islands
Dacus oleae	Olive fruit fly	Olive	Europe, Africa, W.Asia
Dacus passiflorae	Fiji fruit fly	Citrus, mango, guava, peach, fig	Fiji, Indonesia, Malaysia, Japan, Philippines, Pakistan, Thailand
Dacus tryoni	Queensland fruit fly	Citrus, most fruits	Australia, French Polynesia
Dacus tseneonis	Japanese orange fly	Citrus	Japan, China
Dacus zonatus.	Peach fruit fly	Citrus, mango, guava, peach, fig	SE Asia
Dacus spp	Carambola fruit fly	Various fruits	Suriname
Myiopardalis pardalina	Baluchistan melon fly	Melons	SW Asia
Rhagoletis cingulata	European cherry fruit fly	Cherries, honey-suckle, soft fruits	Europe
Rhagoletis cingulate	Eastern (USA) cherry fruit fly	Cherry, prunus spp.	USA, Canada
Rhagoletis complete	Walnut Husk fly	Walnut	USA, Canada
Rhagoletis fausta	Black cherry fruit fly	Cherry	USA, Canada
Rhagoletis indifferens	Western (USA) cherry fruit fly	Cherry	USA, Canada
Rhagoletis indifferens	Western (USA) cherry fruit fly	Cherry	USA, Canada
Rhagoletis pomonella	Apple moggot	Apple	USA, Canada
Dacus oleae	Olive fruit fly	Olive	Mexico

Table IV : Some other Pests of Major International Economic and Quarantine Importance*

Scientific Name	Common Name	Primary Economic Hosts	Geographic Origin
Anarsia lineatella	Peach twig borer	Peach	Europe, Asia, Africa, Canada, USA
Cryptophle bia leucotreta	False codling moth	Cotton, coffee, deciduous fruit, mango, guava	Africa
Cydia molesta	Oriental fruit moth	Peach, other deciduous fruits	North and South America, Asia, Europe
Cydia fenubrana	Plum fruit moth	Prunus spp	Europe, Cyprus, Algeria, Iran, Syria, Turkey, China
Epiphyas postvittana	Light brown apple moth	Deciduous fruit, apple, pear	Australia, Hawaii, New Caledonia, New Zealand, UK
Lobesia botrana	Grape moth	Grapes, prunus spp	Europe
Praya cirti	Citrus flower moth	Citrus	Europe, Asia, Africa
Sternochetus mangiferae	Mango seed weevil	Mango	Asia, Africa, Australia, Pacific Islands, West Indies
Helipus lauri	Avocado seed weevil	Avocado	Mexico, Central America
HENIPTERA-HOMOPTERA			
Aleurocanthus woqlumi	Citrus black fly	Citrus, ornamentals	Mexico, Asia, Florida, South and Central America, West Indies, Africa
Quadraspidiotus perniciosus	San Jose scale	Apple, pears, grapes, other fruits	North America, Asia, Europe, Africa, Australia
Pseudococcus spp.	Mealy bugs	Citrus, ornamentals	Various
DIPTERA			
Liriomyza trifolii	American serpentine leaf miner	Chrysanthemum, cypsophila, tomato, cucurbits	North America, Europe, South and Central America, Africa, Caribbean, Asia
THTSANOPTERA			
Calipthrips fasiatus	Bean Thrips	Beans	North America, Europe

* Taken from Task Force Meeting on Irradiation as Quarantine Treatment, International Consultative Group on Food Irradiation, Chiang Mai, Thailand, 1986, as amended after ICGFI meeting in January 1991, Bethesda, Maryland USA.

Table V : Response of fruits and vegetables to irradiation treatment with respect to damage

Commodity	Dose (kGy)	Damage	Reference
Apple	0.05-03	No	Angerilli & Fitzfibbon (1990)
Apple	0.2-1.0	No	Olsen et al (1989)
Avocado	0.03-0.5	Yes	Akamine & Goo (1971)
Avocado	0.25	Yes	Balock et al. (1966)
Avocado	0.1	Yes	Jessup et al. (1966)
Banana	0.5	No	Balock et al. (1966)
Banana	0.5	No	Ferguson et al (1966)
Blueberry	0.5	Yes	Thomas et al. (1971)
Blueberry	0.25-1.0	Yes	Baton et al. (1970)
Caramboa	1.0	No	Miller et al. (1994)
Caramboa	1.0	No	Gould & von Windeguth (1991)
Cherry, sweet	0.05-05	Yes	Vijaysegaran et al. (1992)
Cherry. Sweet	>0.2	Yes	Eaton et al (1970)
Cucumber	1.0	No	Jessup (1990)
Cranberry	0.3	No	Jessup et al. (1992)
Grape	0.975-1.0	No	Balock et al. (1966)
Grapefruit	0.5-0.79	No	Eaton et al. (1970)
Grapefruit	1.0	Yes	Maxie et al. (1964)
Grapefruit	1.0	Yes	Dennison et al. (1966)
Grapefruit	0.15-0.3	No	Hatton el al. (1982)
Lemon	0.25	No	Lester & Wolfnbarger (1990)
Lemon	0.05	No	Von windeguth & Gould (1990)
Lemon	0.075-1.0	Yes	Jessup et al. (1992)
Lychee	0.5-1.0	Yes	Maxie et al. (1969)
Lychee	0.75-1.0	No	Moy & Nagai (1985)
Lychee	0.5	No	Balock et al (1966)
Mango	0.075-1.0	No	Jessup et al. (1992)
Mango	0.5	No	McLauchlan et al. (1992)
Mango	0.075-1.0	Yes	Akamine & Goo (1971)
Mango	0.75	Yes	Balock et al (1966)
Mango	0.75	No	Beyers et al (1979)
Mango	0.25-0.75	No	Blakesley et al (1979)
Mango	1.0	Yes	Burditt et al (1981)
Mango	0.1-1.0	No	Bustos et al (1992)
Mango	0.6	Yes	Hatton et al (1961)
Mango	0.1-0.25	No	Mitchell et al (1990)
Mango	>0.25	No	Manoto et al. (1992)
Mango	0.75	Yes	Spalding & voa windeguth (1988)
Mango	0.75	No	Thomas & Beyer (1979)
Nectarine	1.0	No	Vijaysegaran et al (1992)
Nectarine	0.3-1.0	Yes	Jessup et.al (1988)
Orange	0.5-075	No	Moy & Nagai (1985)
Orange	1.0	No	Moy et al. (1992)
Orange	0.225-0.3	Yes	Dennisson et.al (1966)
Orange	1.0	No	Jessup et al. (1992)
Orange	1.0	No	Kahan & Monselise (1965)
Passion fruit	0.75-1.0	Yes	Maxie et al. (1969)

Commodity	Dose (kGy)	Damage	Reference
Papaya	0.5-0.75	No	Moy & Nagai (1985)
Papaya	0.25-1.0	No	Moy et al. (1992)
Papaya	1.0	No	Akamine & Goo (1971)
Papaya	1.0	Yes	Akamine & Goo (1971)
Papaya	0.75	No	Balock et al. (1966)
Papaya	0.75	No	Beyers et al (1979)
Papaya	0.25-1.0	No	Bla kesley et al (1979)
Papaya	0.5-0.75	No	Moy & Nagai (1985)
Papaya	0.75	No	Moy et al. (1992)
Papaya	0.3	No	Thomas & Beyer (1979)
Peach	0.3-1.0	No	Vijaysegaran et al (1992)
Peach	0.5-0.75	No	Moy & Nagai (1985)
Pepper, red	0.3	No	Moy et al. (1992)
Plum	0.3-1.0	No	Mitchell et al (1990)
Plum	0.5-0.75	No	Moy & Nagai (1985)
Sour sop	0.1-1.0	Yes	Akamine & Goo (1971)
Tomato	1.0	No	Abdel-Kader et al. (1988)
Tomato	0.25-1.0	No	Balock et al (1966)

Table VI : General Comparison of Quarantine Disinfestation Treatments

Treatment	Cost Competitivenes	Effectiveness on Quarantine Pests	Logistics	Tolerance of Host Commodities	Residues	Remarks
Irradiation	Good	Excellent	Fair	Very good	Nil	Only method available for mango seed weevil
Vapour Heat	Fair	Mainly fruit flies	Fair	Good	Nil	
Hot Air	Fair	Mainly fruit flies	Fair	Good	Nil	
Hot water	Good	Mainly fruit flies	Good	Good	Nil	
Cold Air	Poor	Good	Good	Fair	Nil	
Fumigation	Good	Good	Very good	Very good*	Yes	

Table VII : Some potential applications and limitations of the use of ionizing energy in the processing of fresh fruits and vegetables

Commodities	Treatment objective	Estimated minimum doses required kilogray	Estimated maximum doses tolerated kilograys	Detrimental effects above maximum dose tolerated	Alternative treatments available
Potato, onions, garlic, carrot, table beet, radish, turnip, Jerusalem artichoke, sweet potato yam, cassava, taro, ginger	Inhibition of growth (sprouting and rooting)	0.05-0.10	0.15	Decreased wound heating ability * Tissue discolorations Increase susceptibility to decay	Use of sprout inhibitors (e.g. maleic hydrazide and chloro isopropyl carbamate) Maintenance of optimum temperature and relative humidity
Asparagus	Inhibition of growth (elongation and curvature)	0.05-0.10	0.25	Tissue breakdown Increase susceptibility to decay	Vertical packing and maintenance of optimum temperature (360F, 20C) and relative humidity (95.98%). Use of elevated carbon dioxide atmospheres
Mushroom	Inhibition of growth (cap opening and elongation) Reduce discoloration	0.06-0.50	1.0	Development of effluvious	Prompt cooling and maintenance of optimum temperature (360F, 20C) and relative humidity (95.98%)
Artichoke, asparagus, brussels sprouts, cabbage, cauliflower, lettuce, spinach, other leafy vegetables	Insect disinfestation (prevention of adult emergence)	0.15-0.30	0.25	Loss for green color Steam pitting of artichoke Tissue discoloration	Fumigation with hydrogen cyanide (can be detrimental to quality of most commodities in this group)

Commodities	Treatment objective	Estimated minimum doses required kilogray	Estimated maximum doses tolerated kilograys	Detrimental effects above maximum dose tolerated	Alternative treatments available
Soap beans, sweet corn, cucumber, egg-plant, okra, green peas, bell peppers, summer squash	Insect disinfestation	0.15-0.30	0.50	Loss of green color Increased derating of sweet cora Tissue discoloration	Fumigation with methyl bromide (can be detrimental to quality)
Cantaloupe, honeydew melons, Persian melon, casaba melons, tomatoes	Insect disinfestation	0.15-0.30	1.00	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be detrimental) Short vapor heat treatment
Apple, apricot, blueberry, cherry, fig, loquat, nectarine, peach, pear, persimmon, plum, pomegranate, raspberry, strawberry, tomatillo	Insect disinfestation	0.15-0.30 depending on the commodity	0.50-1.75	Accelerated softening Abnormal ripening	Fumigation with methyl bromide (can be determined) Cold treatments
	Control of postharvest molding	1.50-2.00	3.0		Use of postharvest fungicides
Banana, mango, papaya, pineapple, plantain, guava, lychee, longan, rambutan, cherimoya, carambola, sass ion fruit, sapodilla	Insect disinfestation	0.15-0.30	0.50-1.50 depending on the commodity	Accelerated softening Uneven ripening Tissue discoloration	Hot water or vapor heat treatments Fumigation with methyl bromide (can be determined)
	Retardation of ripening	0.25-1.0			Temperature management Ethylene removal Controlled atmospheres

* This is a problem only for wounds that are made after processing. Prior wounds can be allowed to heal before processing.

Source : Anonymous. Ionizing energy in food processing and pest control: Task Force Report No. 115, June, 1989.

附件7、A successful experience in application of irradiation as quarantine treatment in fresh products

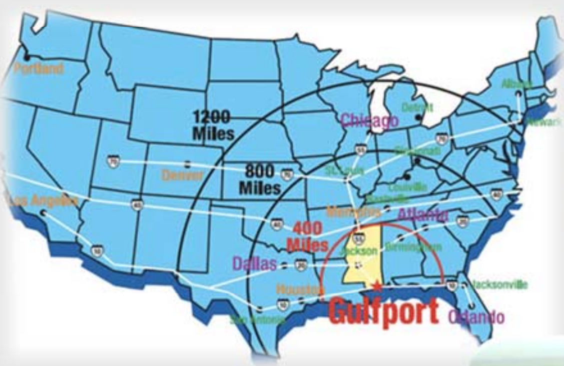
ATEWAY AMERICA

HISTORY OF GATEWAY AMERICA

LOCATION:
GATEWAY AMERICA AIR CARGO PERISHABLE TREATMENT CENTER

Interstate Access:

- 3 minutes from I-10
- 45 minutes from I-59
- 1 hour from I-65
- 2.5 hours from I-20



Ports:

- 5 minutes from Port of Gulfport
- 1 hour from Port of Mobile
- 1.5 hours from Port of New Orleans

ATEWAY AMERICA

SOLUTION PROVIDER

Gateway America is many things to many different companies:

- USDA-APHIS-PPQ Certified Phytosanitary Treatment Facility- Irradiation, Fumigation, and coming soon Cold
- USDA-FSIS Certified Treatment and Export (Meat, Poultry, & Eggs)
- FDA / Dept. of Marine Resources (DMR) Certified for the Treatment of Seafood
- Primus Labs Global Food Safety Initiative (GFSI) Certified Facility
- 3rd Party Warehouse Dry & Chilled Operations -cross-dock, specialty sorting, pick & pack, labeling, re-pack, and
- 3rd Party Logistic Provider
- Air Cargo Handling

ATEWAY AMERICA

PRODUCTS WE TREAT

- Fruits and Vegetables
- Oysters
- Shrimp
- Crabmeat
- Crawfish
- Beef
- Supplements
- Dog Treats
- Bee Hives
- Coming soon Fin Fish

ATEWAY AMERICA

TYPES OF (IR) IRRADIATION TREA

Control

41 days at 34F

Irradiated at 400Gy

41 days at 34F

- Phytosanitary Treatment (Mandated / (POE) Port of Entry
- Mandated FDA Treatments
- Quality Treatment (Shelf-life Extension) Example Asparagus 400Gy @ 36 degrees F 41 days added

TYPES OF (IR) IRRADIATION UNITS

- Gamma
- X-Ray
- E-Beam

ATEWAY AMERICA

NEW COUNTRY ON-BOARDING PROCESS PRIOR TO 1ST SHIPMENT

- Importer
- Grower
- Letter to NPPO
- NPPO
- USDA
- (PRA) Pest Risk Analysis
- Framework Equivalency Work Plan (FEWP)
- Operational Work Plan (OWP)
- Box Material Pest Proof Packaging Approval
- Importer Compliance Agreement (CA)
- Permitting & Import Permit (IP)
- Logistical Planning
- Routing
- Country of Origin Customs Broker Sends Export Documents

GATEWAY AMERICA

NEW COUNTRY ON-BOARDING PROCESS

- US Based Customs Broker Receives Import Documents and Arranging CBP Inspection and Sealing
- Product Arrival @ (POE) Port of Entry
- Customs Border Protection Inspection and Truck Sealing
- Product is Received Seals are Checked and Counts Verified
- USDA Process Configuration with Treatment Facility
- Dose Mapping / Dosimetry
- Production Treatment
- Treatment Data Entered Into the USDA IRADS Database
- Phytosanitary Treatment Certificate Issued
- Product Shipping and Distribution

GATEWAY AMERICA

COUNTRIES AND COMMODITIES THAT ARE APPROVED FOR

APPROVED BEFORE GATEWAY AMERICA LOBBY EFFO

- Mexico – Guava / Manzano Peppers
- Pakistan - Mango

ATEWAY AMERICA

COUNTRIES AND COMMODITIES THAT ARE APPROVED FOR PORT OF ENTRY TREATMENT

LOBBIED BY GATEWAY AMERICA

- Jamaica – Mango (Approved April 4, 2019)
- Dominica Republic / Mango
- South Africa- Litchi / Persimmons / Grapes
- Peru- Blueberries / Figs / Pomegranates
- Grenada - Ambarella
- St. Vincent – Ambarella
- Mexico - Papaya / Goldenberry / Mango / Sweet Orange / Tangerine / Clementine / Mandarin / Tangelo / Sweet Lime / Pitahaya / Pomegranate / Fig / Carambola / Grape Fruit

UPCOMING APPROVALS LOBBIED BY GATI

- St. Lucia- Mango / Ambarella
- Chile – Blueberry / Grape / Cherry
- Colombia - Papaya / Goldenberry / Mango / Sweet Orange / Tangerine / Clementine / Mandarin / Tangelo /Sweet Lime / Pitahaya / Pomegranate / Fig
- Peru- Goldenberry

ATEWAY AMERICA

Blueberry Study

Receive Date:

July 14, 2018

Temperature Range :

33-36 degrees

150 Gy Dose

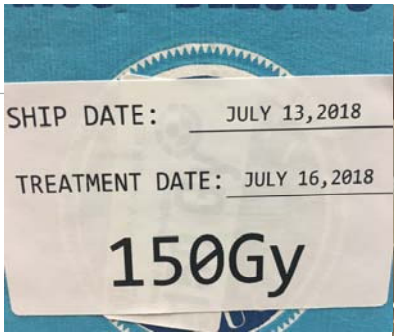
Origin: Michigan

Variety: Duke

Treatment Date:

July 16, 2018

Picture Taken:
October 01, 2018



GATEWAY AMERICA

Blueberry Study

Receive Date:

July 14, 2018

Temperature Range :

0.5-2.5 C (33-36 F)

400 Gy Dose

Origin: Michigan

Variety: Duke/Legacy

Treatment Date:

July 16, 2018

Picture Taken:
October 01, 2018

GATEWAY AMERICA

Blueberry Study

Receive Date:

July 14, 2018

Temperature Range :

0.5-2.5 C (33-36 F)

600 Gy Dose

Origin: Michigan

Variety: Duke/Legacy

Treatment Date:

July 16, 2018

Picture Taken:
October 01, 2018

GATEWAY AMERICA

Blueberry Study

Receive Date:

July 14, 2018

Temperature Range :

0.5-2.5 C (33-36 F)

FUMIGATION

Origin: Michigan

Variety: Duke/Legacy

Treatment Date:

July 16, 2018

Picture Taken:
October 01, 2018

GATEWAY AMERICA

Blueberry Study

Receive Date:

July 14, 2018

Temperature Range :

0.5-2.5 C (33-36 F)

CONTROL 0 Gy Dose

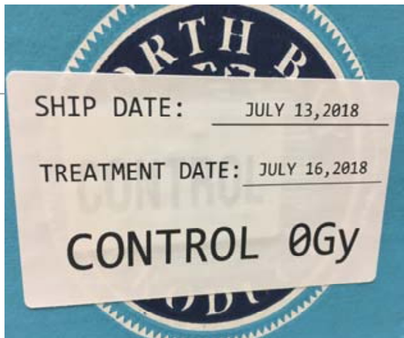
Origin: Michigan

Variety: Duke/Legacy

Treatment Date:

July 16, 2018

Picture Taken:
October 01, 2018



FDA LABEL REQUIREMENTS

- Phrase
  - "treated with irradiation"
  - "treated by irradiation"
- Must be prominent/conspicuous
- Type size not specified but should be as large as ingredient font
- Alternative wording - i.e. "cold pasteurization"
- Irradiated ingredients w/non-irradiated - Retail


FDA MAXIMUM DOSE LIMITATIONS FOR FOOD

Food or Food Ingredient	Application	Maximum Allowable Dose, kGy
White potatoes	Sprouting inhibition	0.15
Fresh, non-heated processed pork	Pathogen control	0.3–1.0
Wheat flour	Mold control	0.5
Fresh produce	Insect disinfestation Growth and maturation inhibition	1.0
Fresh or frozen uncooked poultry products	**Pathogen control**	**3.0**
Fresh shell eggs	Pathogen control	3.0
Fresh iceberg lettuce and fresh spinach	Pathogen control	4.0
Refrigerated, uncooked meat products (sheep, cattle, swine, and goat)	**Pathogen control**	**4.5**
Fresh or frozen mollusk and shellfish	Pathogen control	5.5
Frozen, uncooked meat products (sheep, cattle, swine, and goat)	**Pathogen control**	**7.0**
Seeds for sprouting	Pathogen control	

ATEWAY AMERICA

IRRADIATION BENEFITS

- Shelf-Life Extension
- Cold-Chain is NEVER Broken
- Higher Yield (less shrink)
- Harvest Produce Closer to Ripeness (higher bricks count)
- Origin / Destination Bio Security

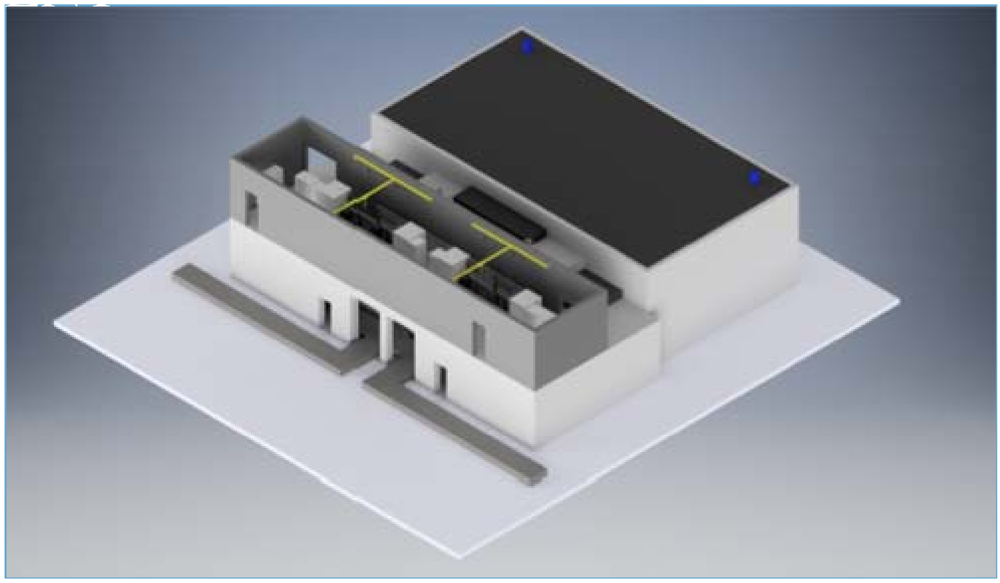
ATEWAY AMERICA

X-RAY

Update on current design and system operations

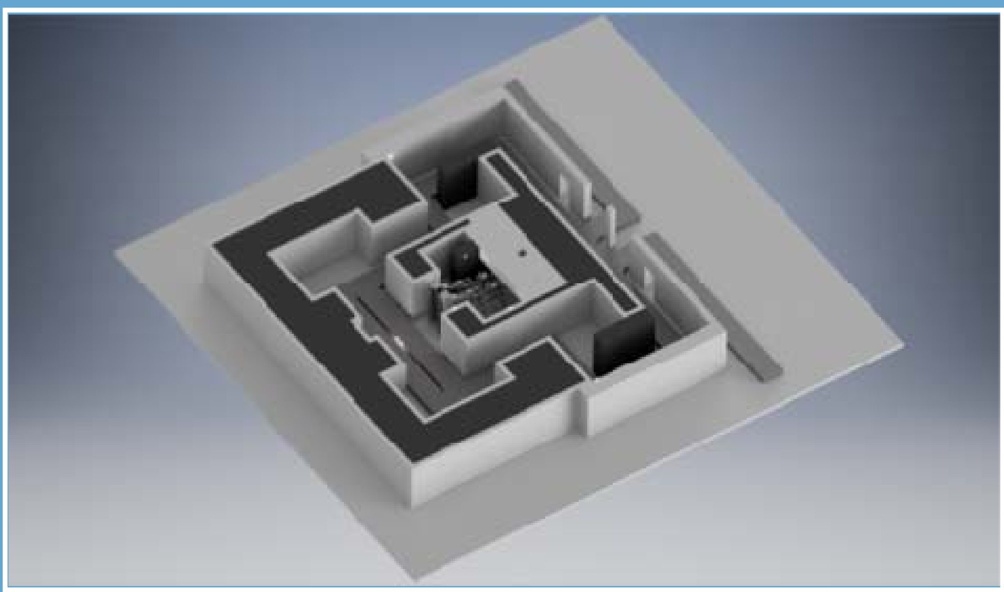
ATEWAY AMERICA

TYPICAL X-RAY PALLET BUNKER WITH EQUIPMENT



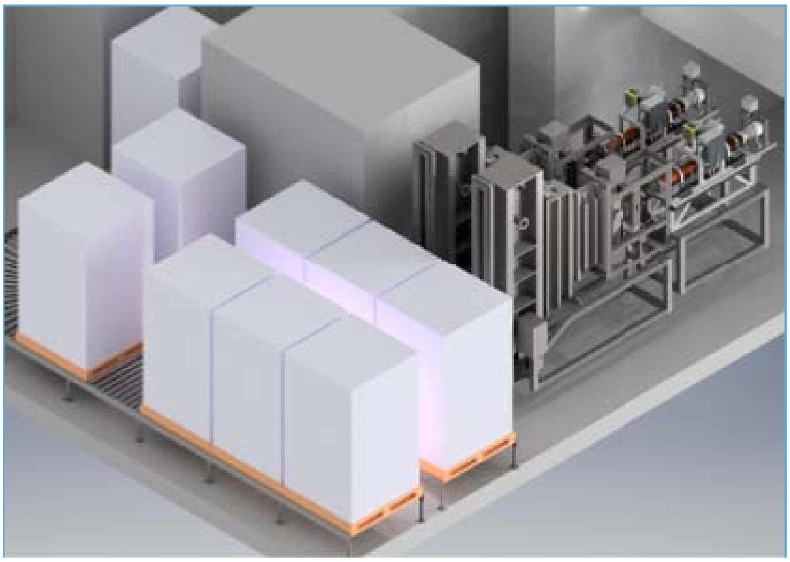
ATEWAY AMERICA

TYPICAL X-RAY PALLET BUNKER CUT AWAY



GATEWAY AMERICA

ILLUSTRATION OF PALLET LOADS OF PRODUCT IN FRONT OF X-RAY



GATEWAY AMERICA

X-RAY IN USE TODAY

Dual Accelerators (rear view) In Accelerator Room

X-Ray Convertors In Treatment Area

GATEWAY AMERICA

X-RAY IN USE TODAY

Pallet Conveyor Showing Rotator

Pallet Conveyor With Slave Pallet In Maze Area Of Bunker

GATEWAY AMERICA

X-RAY PALLET THROUGHPUT FOR PRODUCE

- Min Dose 150 Gy; Max Dose 1 kGy
- Min Dose 400 Gy; Max Dose 1 kGy
- Pallets per hour ≈ 30 per single 80 kW machine
- 150 Gy, 80 kW machine will process 30 pallets/hr
- 400 Gy, 80 kW machine will process 25 pallets/hr

ATEWAY AMERICA

EXPANSION VISION

- Joint Ventures
- Public / Private Partnership
- Multi-Country
- International Organization (OIRSA)
- Government Agencies
- Consumer Awareness
- International Certification
- Critical Mass / Standardization

附件8、Experience of Panama in capture of methyl bromide in fumigation treatments of Teak (Tectona grandis) timbers

Experience of Panama in capture of methyl bromide in fumigation treatments of Teak (Tectona grandis) timbers

Mr. Cesar Maure, OIRSA-Panama SITC Country Manager

BENEFIT OF THE CAPTURE

- Protection of the environment and the community
- Implementing best practices
- Compliance with standards
- Safety for workers, neighbors and passers-by
- Control of health effects.

ORGANISMO INTERNACIONAL
REGIONAL DE SANIDAD
AGROPECUARIA

Servicios Cuarentenarios

Fumigations Multi-Container

Capture Process

- Multiple exchanges of air inside enclosures.
- Measurements of gases throughout the process.
- Capture gas in activated carbon filters.
- Configuration of the primary-secondary-tertiary filter
- Controls the emission of gases into the atmosphere.
- Makes the fumigation process safer

ORGANISMO INTERNACIONAL
REGIONAL DE SANIDAD
AGROPECUARIA

Servicios Cuarentenarios

Capture Technology

- Filters based on activated carbon.
- Used in multiple industries
- Liquid phase or gas
- Washing with methyl bromide or phosphine
- Filter design maximizes efficiency
- Gas flow
- Carbon capacity
- Dynamics of the packed bed
- Carbon type and specifications.
- PH_3 filter treatment
- Water and chemical reaction.
- PH_3 (phosphine) + $2O_2$ (oxygen) H_3PO_4 (phosphoric acid)
- Neutralized to form superphosphate.

Equipment

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA
Servicios Cuarentenarios

Equipment

- 02 blowers 220V
- 03 filters with activated carbon
- 01 tank and connector to extract the activated carbon used
- 16 container consoles (8'6 ")
- 04 container consoles (9'6 ")
- Connectors

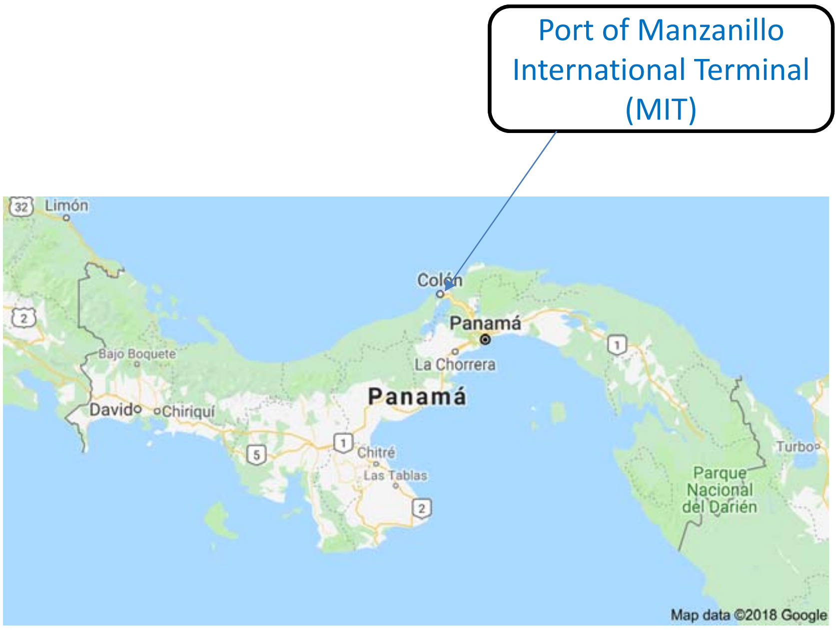


Methyl Bromide Capture Equipment

- The SITC Panama achieved the acquisition of a modern Methyl Bromide Capture equipment which was installed in the Port of Manzanillo International Terminal by technicians of the company Nordiko Quarantine Systems of Australia.
- From August to December 2018, 173 catches of Methyl Bromide have been made to containers.



Location of Methyl Bromide Capture Equipment



Process

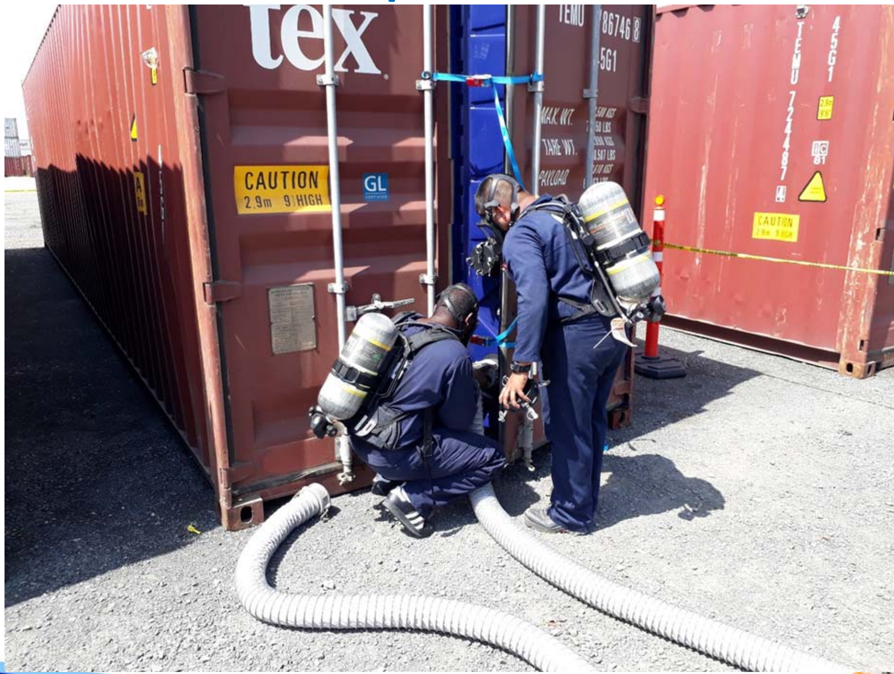
- Install the measuring hoses for Methyl Bromide concentrations
- Place the Bromide capture consoles to the containers
- Perform the application of Methyl Bromide
- Take measurements for fumigation start point
- After the 24 hours of application, the concentration readings are taken
- The Methyl Bromide capture connector is placed
- The Clean Air connector is placed to circulate the chemical
- The time of capture of Methyl Bromide is 3 hours
- After 3 hours and check that the Concentration is below 5ppm, the container is released
- Filter 1 captures 80%, filter 2 captures 20% of the chemical

PLACEMENT OF THE MEASURING HOSES

Install Bromide capture consoles in containers

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA
Servicios Cuarentenarios

Installing the connectors to the doors for the capture of BM

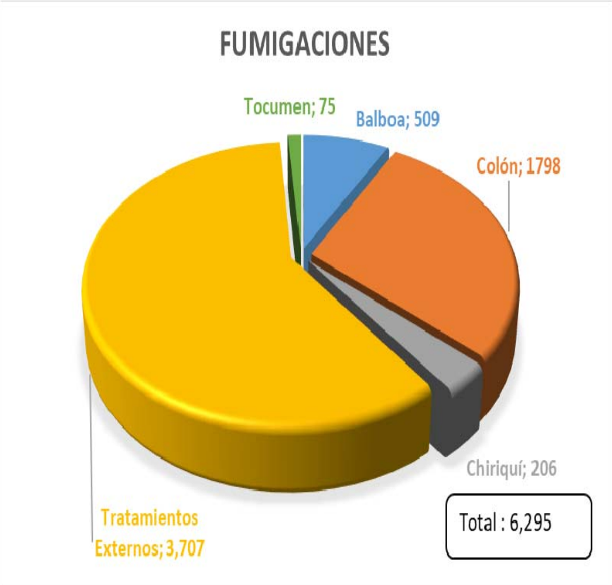


Making the Methyl Bromide Capture

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA
Servicios Cuarentenarios

FUMIGATIONS

Fumigation with Methyl Bromide



Tratamientos a madera de exportación: 6,115

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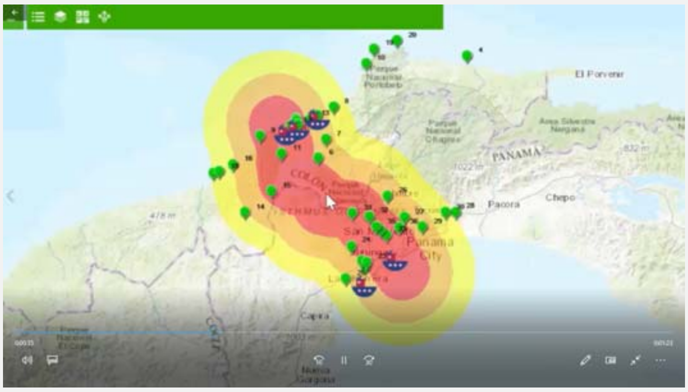
65 ANIVERSARIO 1953-2018

Sixty-five years safeguarding the agricultural heritage of the region!

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA
Servicios Cuarentenarios

附件9、Strengthening biosecurity at the Panama airports, using dog units (canine units)

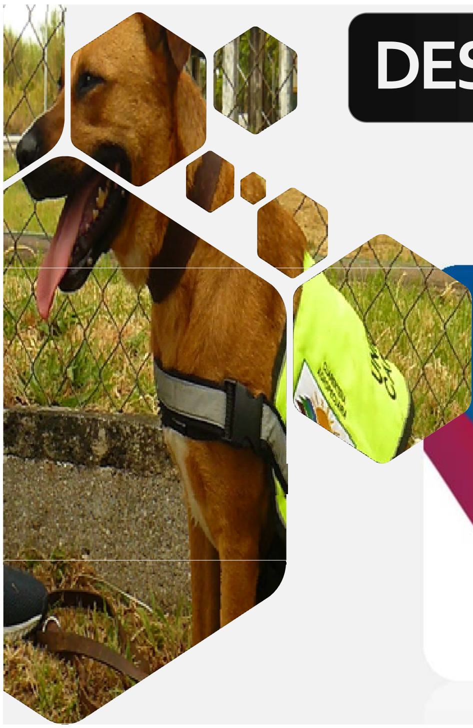
DESAFIOS... CHALLENGES...



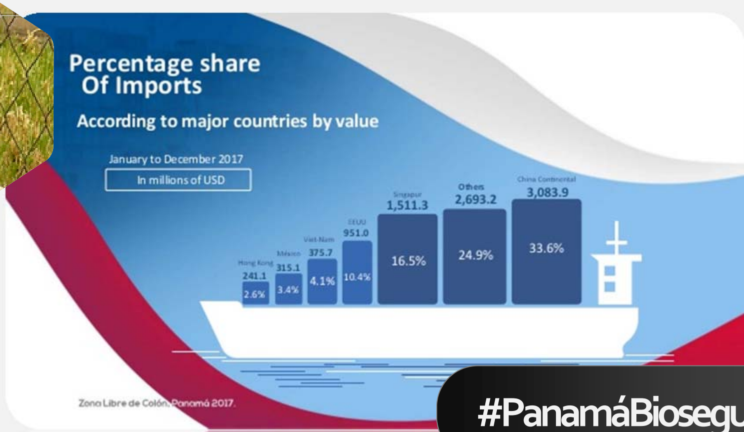
AREA DE PROTECCIÓN

MIDA

DESAFIOS... CHALLENGE...



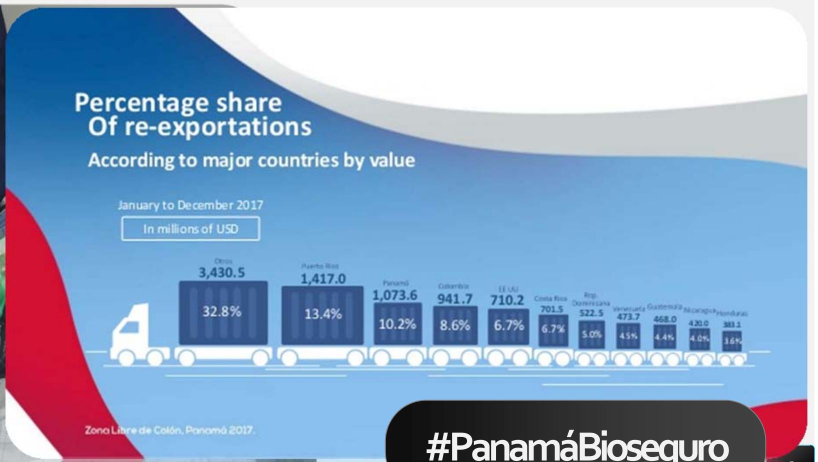
TRANSITS



#PanamáBioseguro

DESAFIOS… CHALLENGE…

TRANSITS



#PanamáBioseguro

UNIDAD CANINA AGROPECUARIA

MISIÓN

- Salvaguardar el Patrimonio Fitosanitario y Zoosanitario del País.

VISIÓN

- Fortalecimiento del Sistema de Inspección Cuarentenaria en los puestos de control cuarentenario y puntos de ingreso al país a través de la utilización de canes adiestrados.

AGRICULTURAL CANINE UNIT

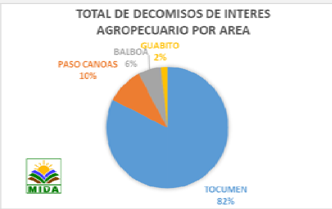
Mission

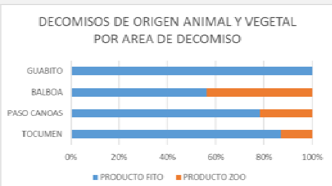
- Safeguard the Phytosanitary and Zoosanitary Patrimony of the Country.

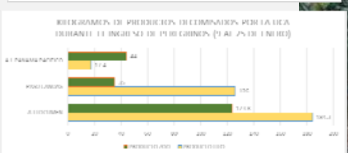
VIEW

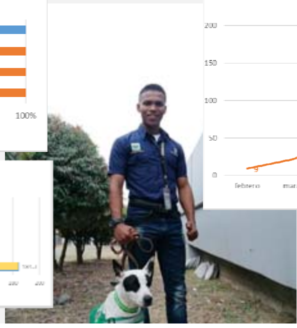
- Strengthening of the Quarantine Inspection System in the quarantine control posts and entry points in the country through the use of trained canes

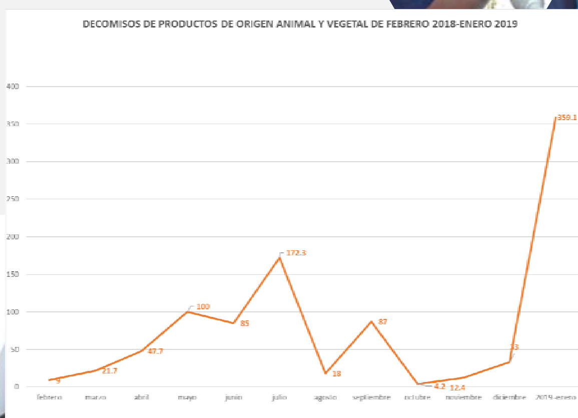
DESAFIOS... CHALLENGES...









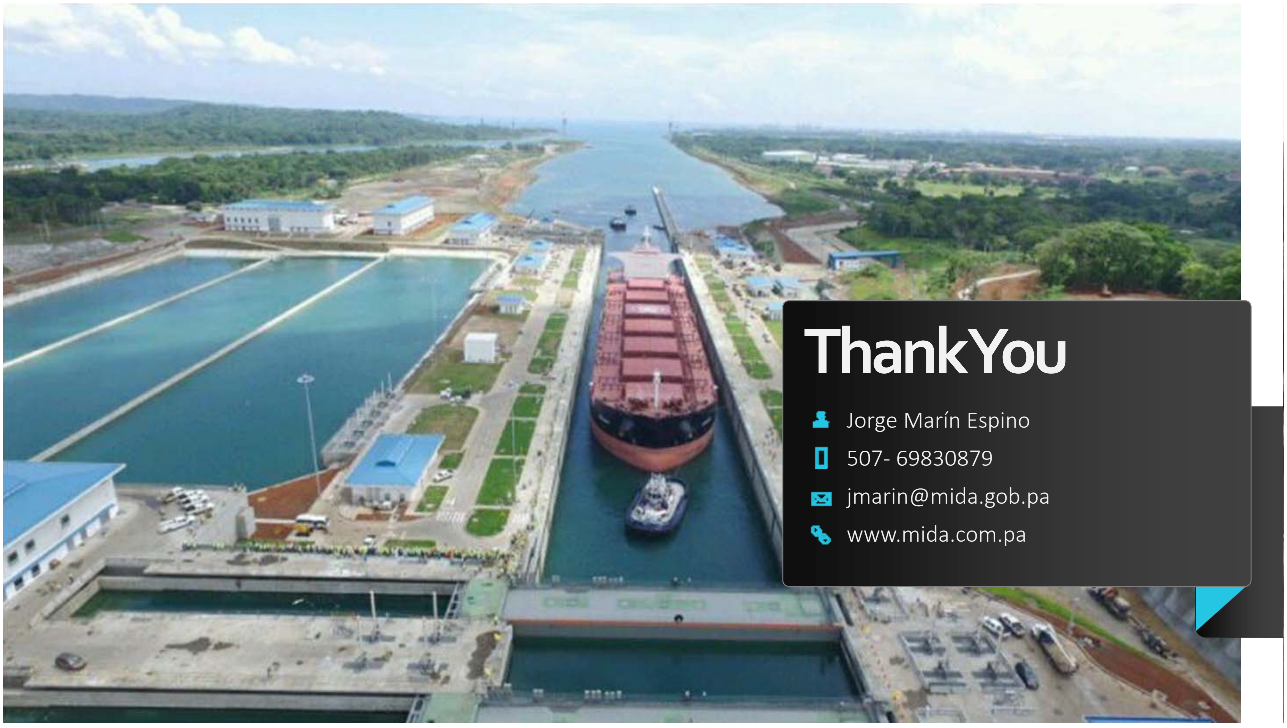


IMPORTANCIA

UCA

Los beneficios de la utilización de Unidades Caninas en el sistema de inspección son:

- Efectividad en la detección e intercepción de productos de riesgo.
- Eliminación de discrecionalidad en la detección de productos.
- Revisión del equipaje con mayor rapidez.
- Disminución de conflictos y desconfianza en los pasajeros, sistema más amigable con el usuario.
- Promoción de la Cultura Sanitaria Agroalimentaria.



附件10、Trial of ICCBA Methyl Bromide Schedule

Ministry for Primary Industries
Manatū Ahu Matua

JABATAN PERTANIAN

Kuala Lumpur-Malaysia,
27th Feb – 1st March 2019

Background

With the methyl bromide methodology finalised; Indonesia, Malaysia and New Zealand volunteered to form a Trial group to implement the processes and procedures to adopt ICCBA methodologies.

Outline

1. Aim of the trial
2. Trial programme
3. Case study – Malaysia
4. Process
5. Conclusion

Trial

Our goal

- To trial the requirements of the ICCBA Methyl Bromide Schedule (draft version 0.12) to provide guidance for intending signatories.

The trial aims to:

- Develop processes and procedures to be considered by the ICCBA Steering Committee;
- Undertake a joint system review of potential applicant systems to determine compliance; and
- Be inclusive and transparent with observers or participants welcome to join.


ICCBA
International Cargo Cooperative Biosecurity Arrangement

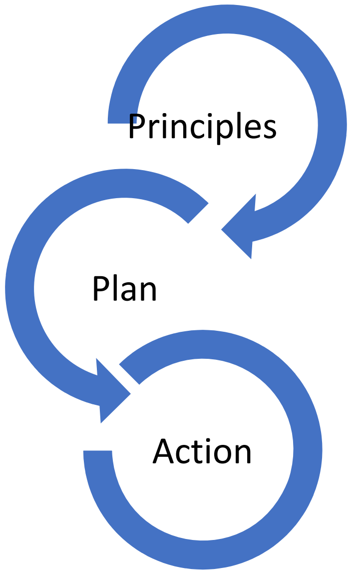
International Cargo Cooperative Biosecurity Arrangement: Methyl Bromide Schedule

Version 0.12

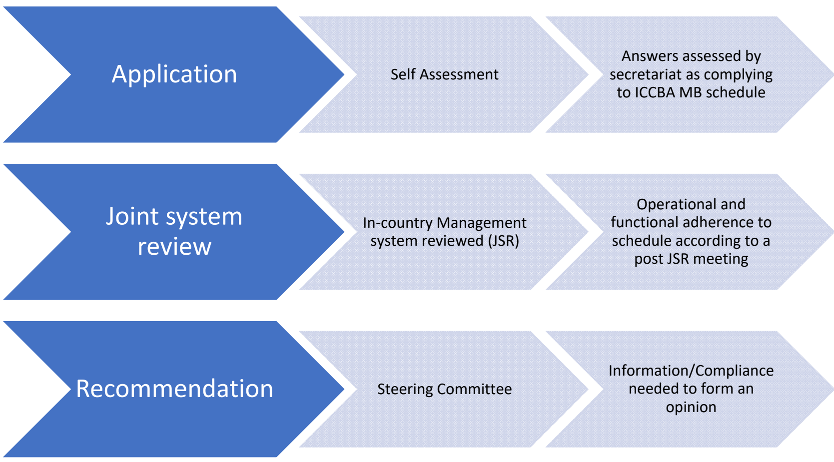
DRAFT

Agreed a set of principles

- Sharing of Information (confidential)
- Roles and responsibilities (trial participants/secretariat)
- Trial participants may use the findings of the review of their individual systems to inform any application to the ICCBA Steering Committee.

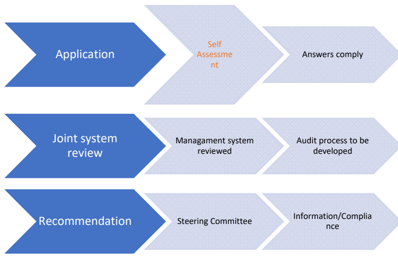


Planned the Process



Self assessment questions

Question	Malaysia response	Indonesia response	New Zealand response	Satisfied?
1 Does your agency provide fumigation training and accreditation to industry? If so, how often?	No training by DOA to the industry	Yes, minimum 1 training for accreditation per year	[illegible]	[illegible]
2 If your agency uses a third party to provide industry training or accreditation, how is this managed?	Fumigation licence is issued by Ministry of Health to fumigators after they pass an examination and assessment. DOA is one of the examination questions panel.	Training and acrreditation managed by government (IAQA)	[illegible]	[illegible]
3 What is your process for accrediting new treatment providers?	Application by treatment providers with documents of fumigation licence, business documents, company profile, competency certificates, list of equipment and operators' details attached.	• Registration process through IAQA audit scheme • Providers have to apply for registration to IAQA audit scheme • IAQA audit scheme will respond to the registration application by verifying the completeness of the required documents and proceed with a registration audit	[illegible]	[illegible]
4 What is your process for auditing treatment providers?	Initial audits on practical & documentation by DOA auditors. Technical committee then will evaluate audit reports and approval will be given by main committee based on technical committee recommendation	• Determine the audit objective (registration, renewal, investigation, surveillance) • Minimum 2 auditors per audit, from the local area and other areas • Audit is conducted on documents and fumigation practices • Audit for registration and renewal based on provider application	[illegible]	[illegible]
5 How do you schedule your audits?	Every 2 years for renewal & unannounced audits every six months	• A registration audit is conducted after all documents required for registration verified and declared complete • Renewal audit is conducted after two years registered and three years extended • Audit surveillance is conducted every 6 months	As outlined in Table 2: Audit frequencies	Mostly when combined with above
6 How many staff do you have capable of auditing treatment providers?	30 auditors in 11 states in Malaysia	50 MB auditors	[illegible]	[illegible]
7 How do you develop staff so that they have the capacity to conduct treatment provider audits?	Treatment and auditing trainings	• Fumigation training to be registered as competent officer • Competent officer must pass the audit training to be registered as auditor • Refresher training to maintain the competency of auditor	[illegible]	[illegible]
8 How will you determine failed fumigations?	Failed fumigation is determined by inspection and interception of pest	By inspection of consignment	[illegible]	[illegible]
9 What action is taken upon the determination of a failed fumigation?	Entry point inspection conducted by Malaysia Quarantine & Inspection Services (MAQIS). Documents required - phytosanitary certificate, treatment certificate, manifests & other related documents.	Issuance of Notification of Non Compliance (NNC) for the exporting country	[illegible]	[illegible]
10 What happens to the goods onshore once a failed fumigation has been determined?	Commodities will be held and to be refumigated or refused entry.	Re-fumigation or destroyed	[illegible]	[illegible]
11 How often does your agency provide internal auditing training?	Training is provided for auditors once a year. Last training was in 2017 (November) during JSR. Fumigation course was conducted once in 2 years for new DOA staff. Last fumigation course was in 2016. However no officers training and fumigation course was conducted in 2018.	Based on the needs, approximately one training per two years	[illegible]	[illegible]
12 What is involved in the accreditation process for officers to become able to deliver training and be part of a master training team?	No specific accreditation for officers to deliver training. Based on experience and external training i.e. AFAS Standards Training by third party and training by DAWR.	• Competent officer on fumigation • Auditor on fumigation • Assessor on fumigation • 10 people Trained as trainer by DAWR in Bali, December 2017	[illegible]	[illegible]
13 How many agency staff are currently capable of delivering fumigation training?	5 people	16 people (incl. the 10 mentioned above)	[illegible]	[illegible]
14 How do you develop staff so that they have the capacity to deliver training?	Experience and external training	By providing experiences in conducting audits and training (incl assessing fumigators in the accreditation training).	[illegible]	[illegible]



Programme of Joint System Reviews - JSR

Timetable of JSR

Country	Trial Agencies	Joint System Review
Indonesia	Center for Plant Quarantine and Biosafety, Indonesian Agricultural Quarantine Agency (IAQA), INDONESIA	July 2019
Malaysia	Accreditation and Compliance, Plant Biosecurity Division, Department of Agriculture, MALAYSIA	25/02/2019 – 1/03/2019
New Zealand	Plants and Pathways Directorate, Ministry for Primary Industries, NEW ZEALAND	September 2019
ICCBA Secretariat Department of Agriculture and Water Resources, AUSTRALIA representing the ICCBA Secretariat		

Case Study Malaysia

- Mature treatment system that has been operational under AFAS since 2007
- Training (relies on other participant countries);
- Auditing programme (supervision, programme and unannounced);
- Treatment providers actively audited;
- Subject to JSR under AFAS each year for Australian bound consignments.

Joint System Review- Malaysia

Participating countries (Indonesia, New Zealand) self selected auditors:

- Indonesia (3)
- New Zealand (1)

JSR:

- Following AFAS protocols plus looking at a wider audience (i.e commodities to all countries not just Australia)

Plan of the Joint System Review

2019 Malaysia Training and ICCBA MB – 25 February to 1 March

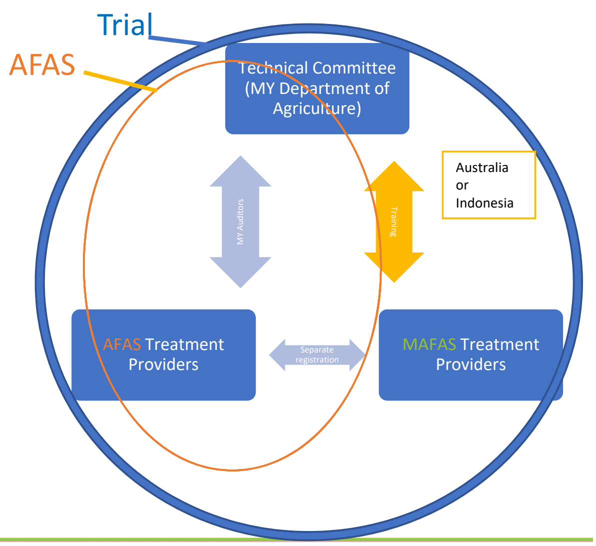
lon 25 Feb	Fumigation Refresher delivered by IAQA		
ues 26 Feb	Audit Refresher training delivered by DAWR		
/ed 27 Feb	Audit Refresher training delivered by DAWR	ICCBA MB Trial Discussion	JSR opening meeting
nurs 28 Feb	Team A Audit 1 -**Far East Fumigation MY0027 MB**	Team A Audit 2 - **Standard Fumigation MY0071**	
	Team B Audit 1 - **Pied Piper Fumigation MY0056 MB**	Team B Audit 2 - **Andikas Management & Services MY0072**	
Fri 1 Mar	Team A Audit 3 - **Excel Fumigation MY0116 MB**	Closing meeting / Travel	
	Team B Audit 3 - **Vigorex Fumigation MY0067 MB**		

Indonesia, NZ and Australia selected the MY Treatment Providers to observe MY auditing

Observations

MY has two systems MAFAS (consignments to countries other than Australia) and AFAS (Australia bound consignments) that are managed according to ICCBA;

- Management structure vests in a technical committee; and
- Auditors, Treatment providers trained by third parties.



Recommendations –specific to Malaysia

Specific to Malaysia

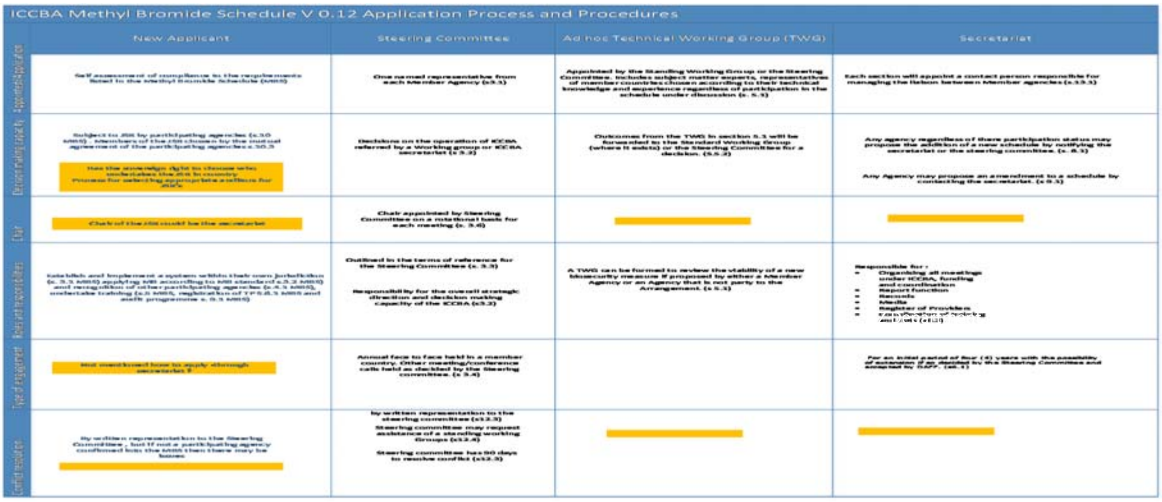
- Have one system for all consignments
- Maintain a training programme (through assistance from other countries)
- Follow up on audit findings

Common Issues

- Auditing monitoring (hand written monitoring records may or may not be true and this is difficult to determine
- Maintaining training programme

Processes and Procedures for new applicants

Gaps in the processes and procedures


ICCBA Methyl Bromide Schedule V 0.12 Application Process and Procedures

New Applicant	Steering Committee	Ad hoc Technical Working Group (TWG)	Secretariat
[illegible]	[illegible]	[illegible]	[illegible]

Conclusion

- Maturity of a treatment system is beneficial to the applicant;
- Potential applicants may wish to trial the programme before adopting a schedule (consider adding in this option into the arrangement Sect 6.4);
- Consideration should be made to establishing an ICCBA technical working group to write up processes and procedures; and
- Auditing start point and end point monitoring is difficult and data loggers may be considered (separate presentation by NZ at plenary)