

28 April to 2 May 2025
Acacia Hotel
Manila, Philippines

Five-day plan

DAY ONE: Monday 28 April 2025

	Industry seminar – hosted by the Bureau of Plant Industry, Philippines <i>Alto function room, Acacia hotel</i>
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DAY TWO: Tuesday 29 April 2025

Morning	ICCBA Technical Working Groups <i>Alto function room, Acacia hotel</i>
Afternoon	ICCBA plenary session <i>Alto function room, Acacia hotel</i>
Evening (6.00pm)	Welcome Reception and QRM delegate registration <i>Guajes function room, Acacia hotel</i>

DAY THREE: Wednesday 30 April 2025

Morning	Field Trip (please refer to agenda for details)
Afternoon	Field Trip (please refer to agenda for details)
Evening	Official QRM Dinner (please refer to agenda for details)

DAY FOUR: Thursday 1 May 2025

Morning	Quarantine Regulators Meeting <i>Sequoia function room, Acacia hotel</i>
Afternoon	Quarantine Regulators Meeting <i>Sequoia function room, Acacia hotel</i>

DAY FIVE: Friday 2 May 2025

Morning	Quarantine Regulators Meeting <i>Sequoia function room, Acacia hotel</i>
Afternoon	Quarantine Regulators Meeting <i>Sequoia function room, Acacia hotel</i>
Afternoon	9 th ICCBA Steering Committee Meeting <i>Sequoia function room, Acacia hotel</i>



Australian Government
Department of Agriculture,
Fisheries and Forestry

2025 Quarantine Regulators Meeting – Industry Day (virtual and in-person meeting)

Link: 2025 Quarantine Regulators Meeting - Industry Day - virtual invitation (Monday April 28, 2025)

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 497 253 880 394

Passcode: L2qy3nC6

Dial in by phone

+61 2 7208 4805, 1680852# Australia, Sydney

Find a local number

Phone conference ID: 168 085 2#

Join on a video conferencing device

Tenant key: 597361668@z.plcm.vc

Video ID: 133 411 585 7



OFFICIAL



Australian Government
Department of Agriculture,
Fisheries and Forestry

Industry Day: Monday April 28, 2025

Time	Agenda Item	Topic
09:00 – 10:00	1	Methyl Bromide: Ozone Science and Regulatory Update <i>Mr. Paulo C. Bondoc, President, Philippine Association of Professional Fumigators, Inc.</i>
10:00 – 10:15		Morning Tea
10:15 – 11:15	2	Methyl Bromide (MB) Alternatives: "Profume in global trade – opportunities and regulations for its use in import and export" <i>Mr. David Marrs, Business Development Manager, APAC at Douglas Products</i>
11:15 – 12:00	3	Networking and Discussion
12:00 – 13:00		Lunch
13:00 – 13:30	4	Mobile Plant Food Safety Laboratory: Bringing Food Safety Closer to Farms <i>Mr. William Mugot, Division Chief of Plant Product Safety Services Division</i>
13:30 – 14:00	5	Phyosanitary Diagnostic Services of the National Plant Quarantine Services Division <i>Mr. Darwin Landicho, Ph.D. Head, National Plant Quarantine Services Division - Central Laboratory</i>
14:00 – 14:15		Afternoon tea
14:15 – 15:00	6	Discussion and Closing <i>Ms. Jean-May R. Tolentino, Chief, National Plant Quarantine Services Division, Philippines</i>

28 APRIL - 2 MAY 2025

ACACIA HOTEL
OFFICIAL

MANILA, PHILIPPINES



Australian Government
Department of Agriculture,
Fisheries and Forestry

Day One: Wednesday 30 April 2025 - Field Trip	
Time	Activity
06:30 – 07:00	Meet at Acacia Hotel Lobby
07:00 – 10:00	TRAVEL From: Acacia Hotel To: Lucban, Quezon, Philippines
10:00 – 11:00	KOPIA Lucban Smart Green House <i>Experience a state-of-the-art agricultural innovation that showcases the future of smart and sustainable farming.</i>
11:00 – 11:30	TRAVEL From: KOPIA Smart Green House To: Bukid Amara
11:30 – 15:00	Bukid Amara (Lunch and Cultural Experience) <ul style="list-style-type: none"> ♦ <i>Escape the hustle and bustle and immerse yourself in the natural beauty of Bukid Amara – a hidden paradise waiting to be explored. Stroll through vibrant landscapes of blooming flowers, perfect for Instagram-worthy photos, learn about sustainable farming with their innovative aquaponics system, and savour local treats and fresh farm produced straight from nature's bounty.</i> ♦ <i>Experience how to make the famous Kiping and Pancit Habhab.</i>
15:00 – 15:30	TRAVEL From: Bukid Amara To: Insular Botanical
15:30 – 16:30	Insular Botanical <ul style="list-style-type: none"> ♦ <i>Experience a paradise for nature lovers and plant enthusiasts. Discover a diverse collection of ornamental plants, medicinal herbs, and native flora.</i>
16:30 – 17:00	TRAVEL From: Insular Botanical To: Bukid Amara
17:00 – 19:00	Bukid Amara <ul style="list-style-type: none"> ♦ Quarantine Regulators Meeting Official Dinner
19:00	TRAVEL From: Bukid Amara To: Acacia Hotel Manila

Day Two: Thursday 1 May 2025 - Presentations

Time	Agenda Item	Topic
08:30	Arrival tea and coffee	
08:45 – 09:00	1a	Official welcome <i>Dr Gerald Glenn F. Panganiban, Director, Philippines Bureau of Plant Industry</i>
09:00 – 09:15	1b	Opening remarks <i>Ms Anna Brazzo, Acting First Assistant Secretary, Compliance & Enforcement Division, Australian Department of Agriculture, Fisheries and Forestry</i>
09:15 – 09:30	2	The role of Australia's Agriculture Counsellor network <i>Dr Rob Atkinson, Australian Counsellor (Agriculture), Bangkok, Australian Department of Agriculture, Fisheries and Forestry</i>
09:30 – 09:45	3	Biosecurity regulation: our collective journey <i>Mr Nathan Reid, Lead Director, Capability and Engagement, Australian Department of Agriculture, Fisheries and Forestry</i>
09:45 – 10:15	Morning Tea and Official Photo	
10:15 – 10:45	4	Using good regulatory practices to improve SPS measures: A win-win for safe trade facilitation <i>Ms Catalina Pulido, Economic Affairs Officer, Standards and Trade Development Facility, World Trade Organization</i>
10:45 – 11:15	5 Virtual Presentation	Building regulatory biosecurity workforce capability <i>Professor David Mackay, Academic Director, Biosecurity Training Centre, Charles Sturt University, Australia</i>
11:15 – 11:45	6	Biosecurity implementations of Türkiye <i>Mrs Şehriban Gören, Coordinator, General Directorate of Food and Control, Ministry of Agriculture and Forestry, Republic of Türkiye</i>
11:45 – 12:15	7	Canada's use of a systems approach to phytosanitary risk management <i>Mr Nitin Verma, Counsellor Agriculture, Indo-Pacific Agriculture & Agri-Food Office, Canadian Food Inspection Agency</i>
12:15 – 13:00	Lunch	
13:00 – 14:00	8	INTERACTIVE PRESENTATION Biosecurity systems: which way is up and how do we get there? <i>Professor Andrew Robinson, Chief Executive Officer, Centre of Excellence for Biosecurity Risk Analysis, Australia</i>
14:00 – 14:25	9 Virtual Presentation	Compliance behaviour in biosecurity regulation <i>Mr Morgan Slater, Senior Program Officer, Compliance Partnerships, Australian Department of Agriculture, Fisheries and Forestry</i>
14:25 – 14:50	10 Virtual Presentation	Use of data to inform audit priorities <i>Mr Jeremy Walton (Director) and Ms Kara Taylor (Assistant Director), Audit and Assurance Branch, Australian Department of Agriculture, Fisheries and Forestry</i>
14:50 – 15:20	11 Virtual Presentation	Digitising trade – a paperless evolution



Day Two: Thursday 1 May 2025 - Presentations

Time	Agenda Item	Topic
		<i>Mr Matt Moore, Director eCert and Micor, Electronic and Paperless Certification and Micor team, Australian Department of Agriculture, Fisheries and Forestry</i>
Afternoon tea		
15:20 – 15:35		
15:35 – 16:05	12	The evolution of biosecurity regulation from the Solomon Island experience <i>Mrs Jean Eero, Acting Director, Biosecurity Department, Ministry of Agriculture & Livestock, Solomon Islands</i>
16:05 – 16:30	13	The future of biosecurity fumigation monitoring <i>Ms Nicole Begg, Assistant Director, Compliance Partnerships, Australian Department of Agriculture, Fisheries and Forestry</i>
16:30 – 17:00	14	Monitoring apps for fumigation by treatment providers <i>Mrs Aprida Cristin, Director for Risk Management of Plant Quarantine, and Ms Ratih Rahayu, Plant Quarantine Analyst, Indonesian Quarantine Authority</i>

Day Three: Friday 2 May 2025 - Presentations

Time	Agenda Item	Topic
08:45		Arrival tea and coffee
09:10 – 09:40	16 Virtual Presentation	Strengthening regional biosecurity and phytosanitary systems <i>Mr Chris Date, Director, International Capacity Development, Australian Department of Agriculture, Fisheries and Forestry</i>
09:40 – 10:10	17	Promoting safe agri-food trade through partnerships and innovation – lessons from STDF's work <i>Ms Catalina Pulido, Economic Affairs Officer, Standards and Trade Development Facility, World Trade Organization</i>
10:10 – 10:40	18	Strengthening compliance: Operational Coordination Committee <i>Ms Anna Brezzo, Acting First Assistant Secretary, Compliance & Enforcement Division, Australian Department of Agriculture, Fisheries and Forestry</i>
10:40 – 10:55		Morning tea
10:55 – 11:20	19	Canada's approach to African Swine Fever (ASF) prevention and preparedness <i>Dr Parthiban Muthukumarasamy, Executive Director, and Dr Suminder Sawhney, Senior Director, International Programs Directorate, Canadian Food Inspection Agency</i>
11:20 – 11:50	20 Virtual Presentation	Regulating phytosanitary irradiation – exploring opportunities and challenges



Day Three: Friday 2 May 2025 - Presentations		
Time	Agenda Item	Topic
		<i>Ms Tash Voysey, Assistant Director, Market Coordination and Strategy Program, Australian Department of Agriculture, Fisheries and Forestry</i>
11:50 – 12:20	21	Exploring Ethyl Formate as a quarantine treatment for fresh fruits: findings from initial trials <i>Ms Jhang Yu-Ling, Specialist, Animal and Plant Health Inspection Agency, Ministry of Agriculture, Taiwan</i>
12:20 – 12:50	22 Virtual Presentation	Hitchhiker pest surveillance beyond the Australian border <i>Dr Andrew Tomkins, Director, Operational Science and Surveillance, Hitchhiker Section, Australian Department of Agriculture, Fisheries and Forestry</i>
12:50 – 13:35	Lunch	
13:35 – 14:00	23 Virtual Presentation	Biosecurity innovation: a future ready focus <i>Ms Jessica May, Director, Research and Innovation, Australian Department of Agriculture, Fisheries and Forestry</i>
14:00 – 14:25	24	Overview of sea containers survey in the Philippines <i>Mr Arnold S. Dela Cruz, Jr., Supervising Agriculturist and Regional Manager, Bureau of Plant Industry Philippines</i>
14:25 – 14:55	25	Modernizing biosecurity regulation through trade facilitation support <i>Mr Melvin Spreij, Senior Trade Specialist, World Bank Group</i>
14:55 – 15:20	26	Strengthening regional biosecurity: insights from OIRSA's visit to Australia <i>Mr Iván Hernández, Regional Director, Quarantine Services, International Regional Organisation for Plant and Animal Health (OIRSA)</i>
15:20 – 15:45	27	Closing remarks <i>Ms Anna Brozzo, Acting First Assistant Secretary, Compliance & Enforcement Division, Australian Department of Agriculture, Fisheries and Forestry</i>
15:45 – 16:00	Afternoon tea	
16:00 – 17:00	28	9th International Cargo Cooperative Biosecurity Arrangement (ICCBA) Steering Committee meeting

METHYL BROMIDE: OZONE SCIENCE AND REGULATORY UPDATE

Quarantine Regulators Meeting

28 April 2025
Acacia Hotel, Manila, Philippines

Presented by:

Mr. Paulo C. Bondoc

Chief Operating Officer, Pacific Fumigation Co., Inc.
Methyl Bromide Product Specialist (Philippines), Mebrom Ltd.
President, Philippine Association of Professional Fumigators, Inc.

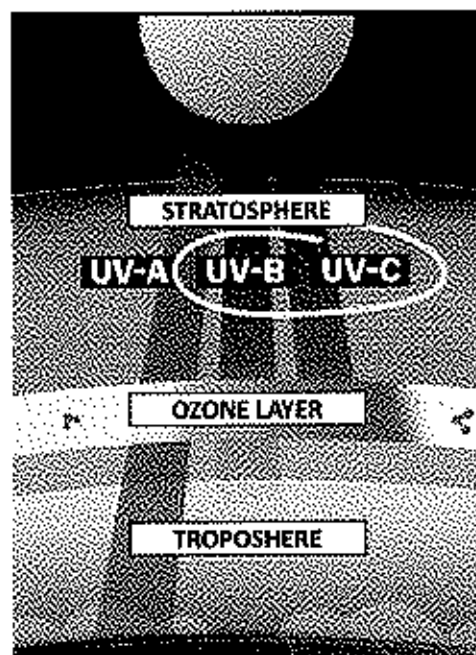
THE HOLE IN THE OZONE LAYER IS HEALING

DAMAGED OZONE LAYER: WHAT HAPPENS?

The **ozone layer** is like Earth's sunscreen, located in the stratosphere, and it protects us by absorbing most of the Sun's harmful ultraviolet (UV) radiation.

When ozone layer is damaged:

- More harmful UV rays reach Earth's surface.
- This can lead to:
 - Higher rates of skin cancer and cataracts in humans.
 - Weakened immune systems.
 - Harm to crops, animals, and marine life, etc.



OZONE DEPLETION and GLOBAL WARMING

Ozone depletion and global warming are separate problems, but they interact:

Ozone Depletion	Global Warming
Caused by chemicals like CFCs, halons, methyl bromide, etc.	Caused by greenhouse gasses like carbon dioxide, methane, nitrous oxide, sulfuryl flouride, etc.
Leads to more harmful UV radiation reaching the earth	Traps more heat in Earth's atmosphere
Affects health and ecosystem	Climate change, sea levels, weather, etc. (fires, floods, storms, hunger, poverty..)

HISTORY OF THE MONTREAL PROTOCOL

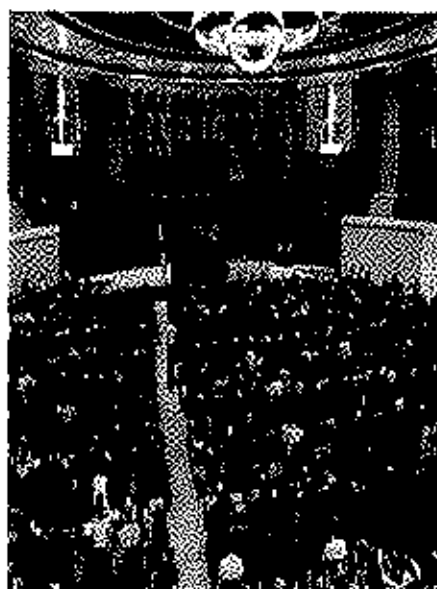
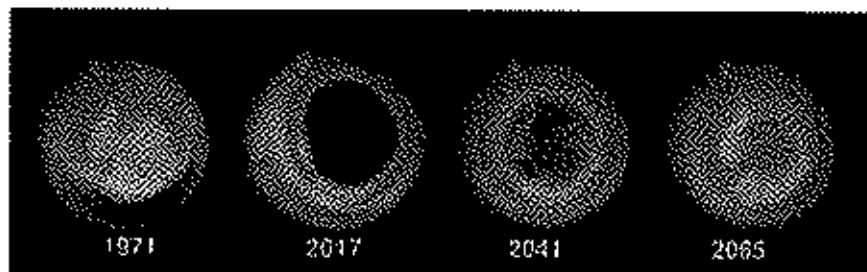
- In 1978, scientists discovered that the use of CFCs (Freons) was contributing to a thinning of the layer of ozone that protects the earth from harmful UV rays ("ozone hole")
- In 1989, nations adopted the "Montreal Protocol on Substances that Deplete the Ozone Layer"
- In ratifying the Protocol, nations agreed to take steps to limit the production and use of CFCs



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THE MONTREAL PROTOCOL SUCCESS

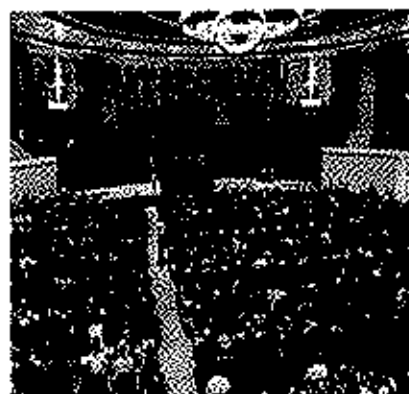
1. Since its adoption in 1989, the Montreal Protocol has been successful in:
 - Virtually eliminating emission of Ozone Depleting Substances
 - Putting the ozone layer on a path to recovery by 2050



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THE MONTREAL PROTOCOL SUCCESS

2. Methyl Bromide emissions have been reduced by almost 90% to a steady state value of 10 Kmt per year for QPS uses
3. The most recent projections on ozone layer recovery assume continued Methyl Bromide use at current level
4. Total elimination of all QPS use would have no measurable effect on ozone layer recovery



There is no justification for further reduction in Methyl Bromide emissions – it would give no environmental benefit

LIST OF OZONE DEPLETING SUBSTANCES

The Montreal Protocol on Substances that Deplete the Ozone Layer (adopted in 1987) lists several Ozone Depleting Substances (ODS) that countries agreed to control and eventually phase out. These substances include:

Annex A, Group 1	CFCs (Chlorofluorocarbons)	Refrigerants, aerosol propellants, foam blowing agents
Annex A, Group 2	Halons	Fire suppression systems (aviation, military, high-value facilities)
Annex B, Group 1	Other CFCs	Solvents, foam production
Annex B, Group 2	Carbon Tetrachloride	Industrial solvent, chemical feedstock
Annex B, Group 3	Methyl Chloroform	Degreasing solvent in metal and electronics industries
Annex C, Group 1	HCFCs (Hydrochlorofluorocarbons)	Transitional refrigerants, air conditioning, foam blowing agents
Annex C, Group 2	HBFCs (Hydrobromofluorocarbons)	Rare use in fire suppression and specialty applications
Annex E, Group 1	Methyl Bromide	Soil fumigation, pest control, quarantine and pre-shipment (QPS) treatments
Annex F, Group 1	HFCs (Hydrofluorocarbons)*	Refrigerants and foams (no ODP but high Global Warming Potential – GWP)

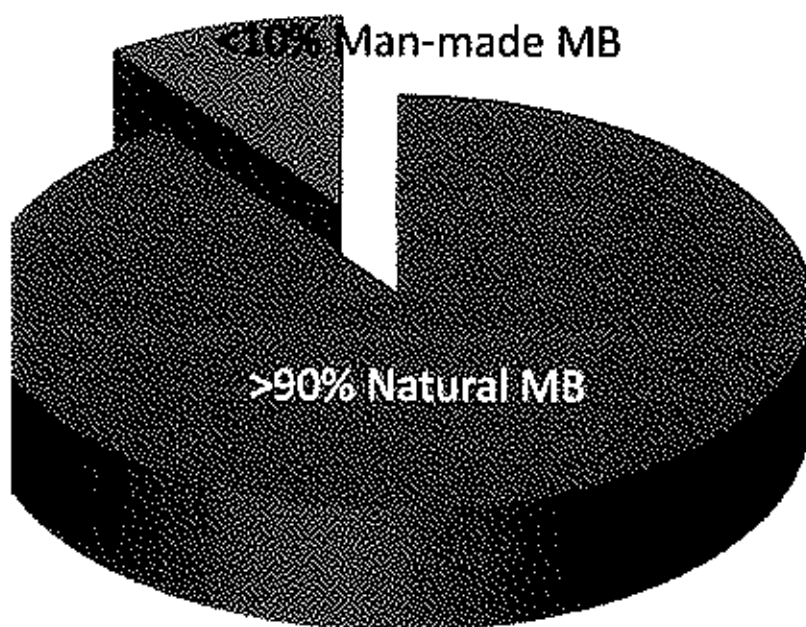
*HFCs are not ozone-depleting, but are controlled due to their climate impact under the Kigali Amendment (2016).

WHAT IS METHYL BROMIDE?

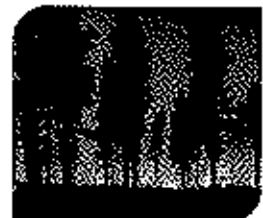
- A gas produced mostly biologically but also industrially
- First introduced as a pesticide in 1932
- A leading fumigant for QPS fumigation
- Annual production/consumption: +/-13,000 tonnes/year
- ~ 10,000 tonnes per annum declared QPS use (UNEP)
- Identified in the Montreal Protocol as **Ozone Depleting Substance**



BOTH NATURAL AND ANTHROPOGENIC SOURCES



Oceans



Wildfires



Rice fields



Salt marshes

WORLDWIDE USE OF METHYL BROMIDE



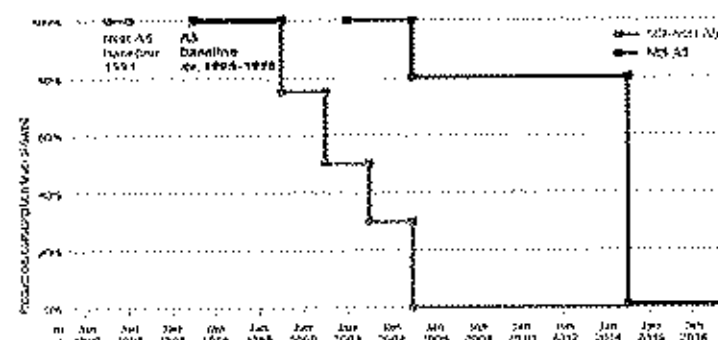
= Active Registration

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METHYL BROMIDE IN THE MONTREAL PROTOCOL

- Methyl Bromide was found to contribute to ozone depletion and added to the MOP in 1995
- A schedule was put in place, requiring developed nations to phase out controlled (mostly soil) uses by 2005, and developing nations by 2015
- Exemptions were allowed for Emergency Uses & Critical Uses, and require yearly application
- Quarantine and Preshipment Uses are not controlled under the Montreal Protocol

Methyl Bromide (Annex E) production/consumption schedule



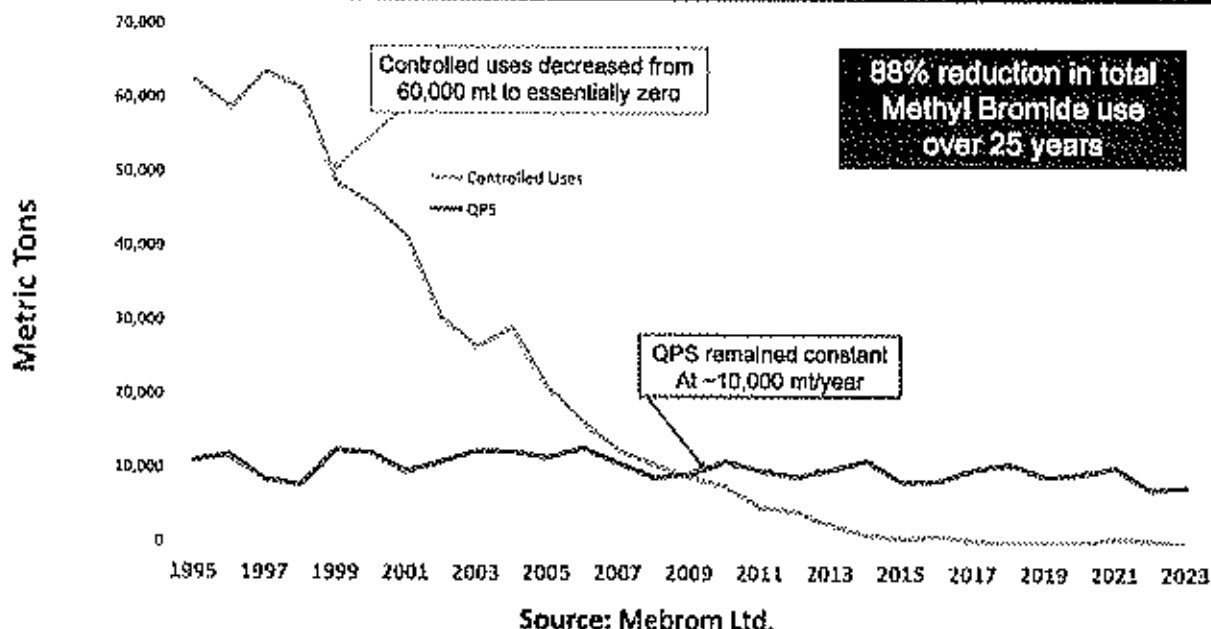
Source: Mebrom Ltd.

Non-A5 (Developed Nations) - America, Canada, European Union Members, UK, Australia, Japan, South Korea, New Zealand, Norway, Switzerland, Israel

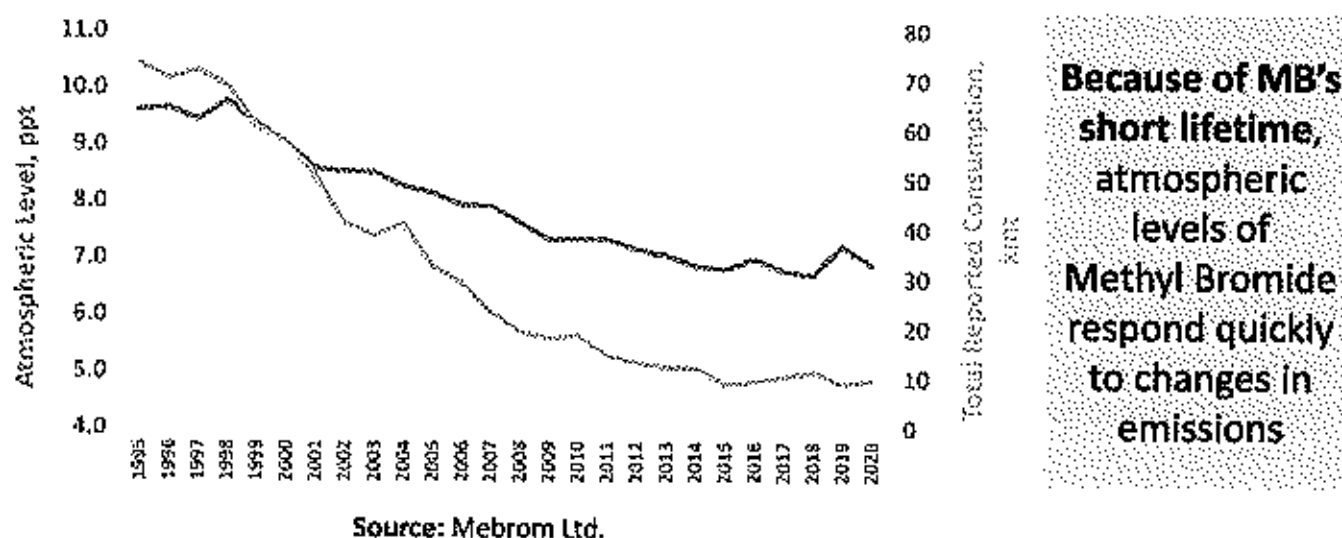
A5 (Developing Nations)

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GLOBAL METHYL BROMIDE CONSUMPTION (1995 - 2023)



MB: TOTAL CONSUMPTION AND ATMOSPHERIC LEVELS



Sulfuryl Fluoride (SO_2F_2) stays in the atmosphere for ~36 years.

Mühle, J., Huang, J., Weiss, R. F., Steele, L. P., et al. (2009). *Sulfuryl fluoride in the global atmosphere*. Journal of Geophysical Research: Atmospheres, 114(D5), D05306. <https://doi.org/10.1029/2008JD011162>

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While sulfuryl fluoride is very stable and stays in the atmosphere for a long time,

its fluorine atoms

don't significantly destroy ozone

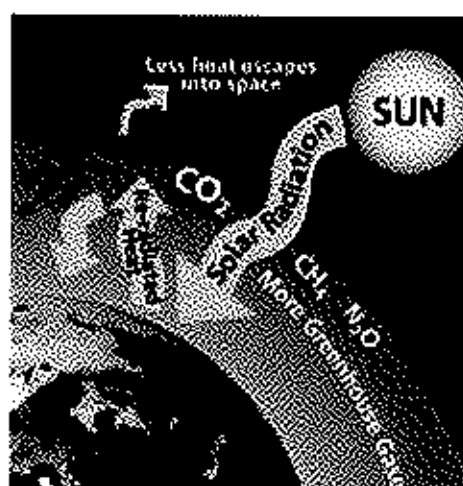
like chlorine or bromine atoms do.

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SF: UNDER SCRUTINY FOR GREENHOUSE GAS EMISSIONS

BUT — we have to take note that:

- SF is a very powerful greenhouse gas — ~4,800 times more potent than CO₂ over 100 years.
- Its concentration in the atmosphere has been rising



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SF: UNDER SCRUTINY FOR GREENHOUSE GAS EMISSIONS



GREENHOUSE GASES

Fumigant under scrutiny for greenhouse gas emissions

by Brett E. Erickson

November 3, 2022 | A version of this story appeared in Volume 100, Issue 39

A common fumigant used primarily to control termites in residential buildings is a significant contributor to greenhouse gas emissions, environmental groups claim in a legal petition to California air regulators. The groups are urging the California Air Resources Board to phase out fumigants that contain sulfuryl fluoride because of the chemical's strong ability to trap heat in the atmosphere. Sulfuryl fluoride is 4,800 times as potent as carbon dioxide in terms of its greenhouse gas potential, the groups say. "Phasing out sulfuryl fluoride would provide the same climate benefits as taking 1 million cars off our roads every year," Jonathan Evans, environmental health legal director at the Center for Biological Diversity, says in a statement.

PHOTO COURTESY OF THE CENTER FOR BIOLOGICAL DIVERSITY

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SF: UNDER SCRUTINY FOR GREENHOUSE GAS EMISSIONS

PETITION TO REGULATE SULFURYL FLUORIDE TO REDUCE THE USE OF THE HIGH GLOBAL WARMING POTENTIAL PESTICIDE

October 27, 2022

Liane Rudolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814
Liane.Rudolph@arb.ca.gov

Re: Petition to Regulate Sulfuryl Fluoride to Reduce the Use of the High Global Warming Potential Pesticide

Case by Biological Diversity
(212 Broadway, Suite 800, Oakland, CA 94612)
tel: (510) 844-7100 fax: (510) 844-7120
www.biologicaldiversity.org

Source:

https://www.biologicaldiversity.org/programs/environmental_health/pdfs/Sulfuryl-Fluoride-Petition-vFIN.pdf

VIII. Conclusion

Now that it is known and well supported by science that sulfuryl fluoride is a highly potent greenhouse gas that can remain in the atmosphere for 36 years, and there are viable alternatives to the fumigant, Petitioners request that CARB 1) initiate a rulemaking to include sulfuryl fluoride in California's annual statewide greenhouse gas inventory pursuant to AB 32 and 2) initiate a rulemaking to phase out the use of sulfuryl fluoride.

Respectfully submitted,

Jonathan Evans
Jonathan Evans, Senior Attorney &
Environmental Health Program Legal Director
Email: jevans@biologicaldiversity.org

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Coauthored by Petitioners

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METHYL BROMIDE EXEMPTIONS FROM THE PROTOCOL

Quarantine and Pre-shipment

- "The calculated levels of consumption and production under this Article shall not include the amounts used by the Party for quarantine and pre-shipment applications."

Article 2H, paragraph 6 of the Montreal Protocol

Critical Use

- "This paragraph will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be critical uses."

Article 2H, Paragraph 5

Emergency Use

- "The Ninth Meeting of the Parties decided in Dec. IX/7 to allow a Party, upon notification to the Secretariat, to use, in response to an emergency event, consumption of quantities not exceeding 20 tonnes of methyl bromide."

Decision IX/7: Emergency methyl-bromide use

QUARANTINE & PRESHIPMENT (QPS): DEFINITION

Quarantine

- "Quarantine applications" are fumigations to prevent the introduction, establishment and/or spread of quarantine pests (including diseases). Applications must be performed by or authorized by a national or regional authorities. Quarantine pests are pests of importance to the threatened area, but not yet present or widely distributed.

Preshipment

- "Pre-shipment applications" are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country.

SUSPICIOUS SHIPMENTS

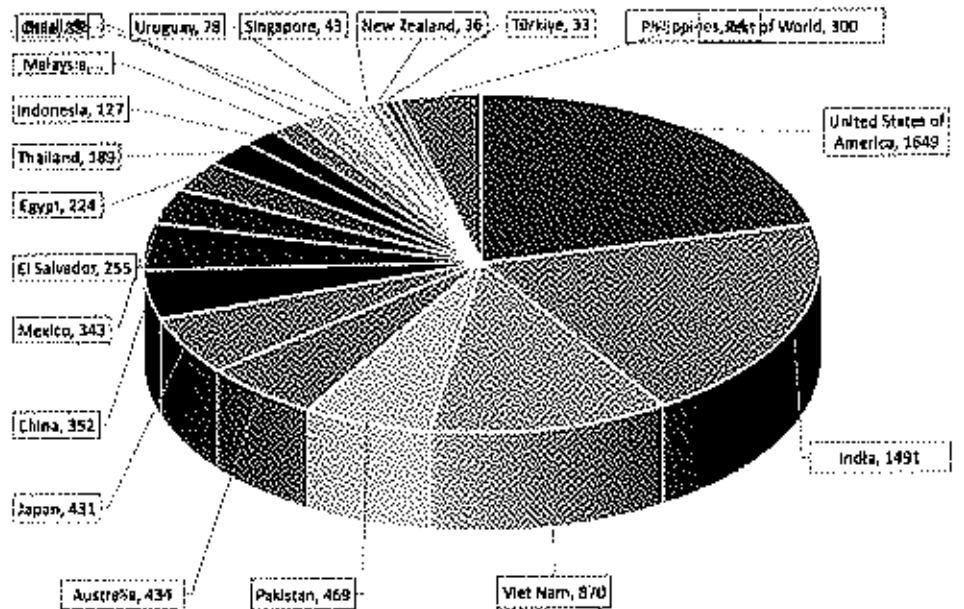
Publicly available trade data indicate that, since 2021, shipments of cans from an Indian manufacturer labeled as "Vinyl Bromide" (VB) to an importer in the Philippines

Cans are inappropriate for the shipment of Vinyl Bromide because (1) the only known use of VB is as a feedstock and (2) when shipped from legitimate origins, VB is packaged as a 25% solution in tetrahydrofuran

QPS USE BY COUNTRY (2023, TONS)

Many of the nations that use the greatest amount of Methyl Bromide for QPS have been outspoken in Montreal Protocol meetings in defense of continued QPS use.

There has been no significant effort to eliminate QPS.



Source: Mebrom Ltd.

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SCENARIO FOR RECOVERY OF OZONE

Source: Mebrom Ltd.

QPS use continues at current level

QPS production eliminated from 2020

Scenario and Cases	Percent Difference in Integrated EESC Relative to Baseline Scenario for the Mid-latitude Case		Year When EESC is Expected to Drop Below 1990 Value	Change in Cumulative ODP-Weighted* Emissions: 2020-2060	Change in Cumulative GWP-Weighted* Emissions: 2020-2060	Percent Difference in Integrated O ₃ Depletion*: 2020-2060
	Mid-latitude Case ^a	Antarctic Winter ^b				
	EESC dt: 1990	EESC dt: 2020		(Million tons CFC-11-eq)	(Billion tons CO ₂ -eq)	
Scenarios						
A1: BaseLine scenario	0.0	0.0	2049.4	2075.7	0.00	0.00
Cases* of zero production from 2020 onward of:						
PO: All ODS	-4.2	-19.1	2046.8	2070.3	-0.88	-5.8
CFCs	-0.0	-0.0	2019.4	2075.7	-0.00	-0.00
Halons	-0.0	-0.0	2019.4	2075.7	-0.00	-0.00
HCFCs	-0.8	-3.0	2048.6	2075.3	-0.12	-4.0
CH ₂ Br for QPS and CUE ^b	-1.5	-6.8	2048.2	2074.2	-0.18	-0.00
CCl ₄	-2.2	-9.9	2046.6	2072.3	-0.59	-1.8

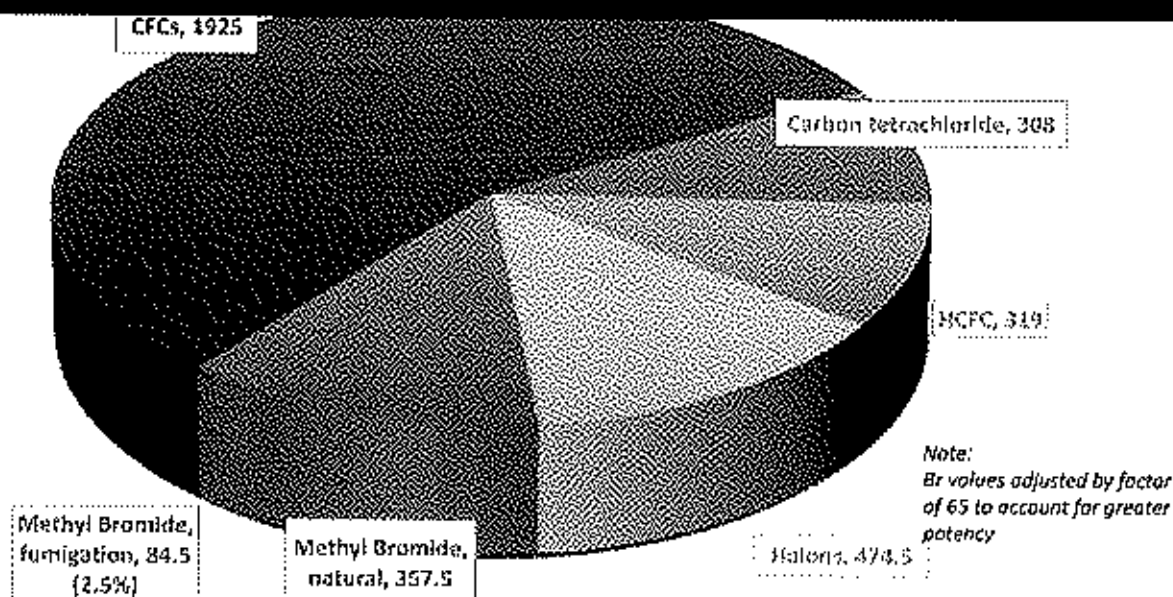
Table 6.5 from Scientific Assessment of Ozone Depletion, 2018

Equivalent Effective Stratospheric Chlorine (EESC)
- is a scientific estimate used to describe the combined effect of all ozone-depleting substances (like CFCs, halons, and methyl bromide) on the ozone layer

Total elimination of Methyl Bromide for QPS use advances ozone recovery by only one year

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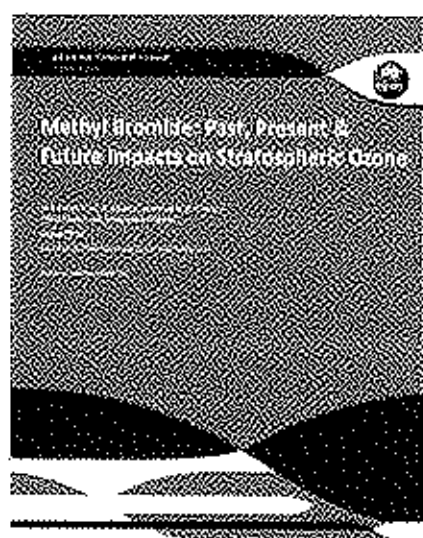
CONTRIBUTION OF ODS TO TROPOSPHERIC Cl AND Br, 2020 (ppt)



Source: Mebrom Ltd.

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FUTURE IMPACT ON OZONE LAYER



Conclusions

- Total elimination of all anthropogenic Methyl Bromide emissions may not return atmospheric Methyl Bromide levels to pre-industrial levels
- Future regulation of the remaining Methyl Bromide production/consumption in fumigation (largely QPS) will have little impact on ozone recovery.
- Reductions in future total emissions of all ODSs could significantly hasten ozone recovery, but Methyl Bromide will play a minor role.

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MB ALTERNATIVES FOR QPS APPLICATION: COMPARISON

	Fumigant	Registration	Training	Availability	Transport	Speed	Efficacy	Toxicity
Best	Methyl Bromide	Worldwide	Many trained applicators	Multiple global suppliers	Lightweight steel cylinders	Usually 2-4 hours	All life stages	Moderate human toxicity
Acceptable	Sulfuryl Fluoride	N. America, Europe*	Special training required	Only two suppliers	Very heavy steel cylinders	Usually 2-4 hours**	Weak against immature	Moderate human toxicity
Poor	Aluminum Phosphide	Worldwide	Many trained applicators	Multiple global suppliers	Cardboard boxes	48 hours*	Resistance develops	Moderate human toxicity
	Gas Phosphine	Select countries worldwide	Special training required	One supplier	Heavy steel cylinders	48 hours*	Resistance	Moderate human toxicity
	Ethyl Formate	Few Countries	Few trained applicators	One supplier	Highly flammable	Limited Data	Limited Data	Low human toxicity
	Hydrogen Cyanide	Very Few	Special training required	One supplier	Flammable and highly toxic	2-4 hours	All life stages	Highly toxic, CWC**
	Cyanogen (EDN)	Very Few	Special training required	One supplier	Flammable and highly toxic	2-4 hours	All life stages	Highly toxic, CWC**

* May require two applications ** Chemical Weapons Convention

SF needs plenty of more dosage to control the egg stages of pest insects than the other stages (Reichmuth and Klementz, 2008)

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MEBROM SUPPORTS METHYL BROMIDE



- ✓ Participation to Montreal Protocol meetings for 15 years
- ✓ Regular Participation to other fumigation conferences
- ✓ Robust Product Stewardship program
- ✓ Maintains registrations in over 40 countries
- ✓ Supports costly research programs required for registration as MB Industry Panel member
- ✓ Supports innovations in product labeling
- ✓ Constantly invests in upgrades to manufacturing facilities and cylinder fleet
- ✓ Extensive involvement in the development of the GDU

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FUTURE OF METHYL BROMIDE FOR QPS

- Little effect on ozone
- Widely registered
- Strong support
- Proven record
- Alternatives' limitations
- Experienced users worldwide
- Manufacturers in USA, India, & Israel

*The use of
Methyl Bromide
in QPS application
is secure
for many more
years...*



THANK YOU !



ProFume® fumigant in Global Trade Opportunities and Regulations for use in Export and Import

David Marrs
APAC Business Development Manager



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David Marrs - Intro



- ✓ Joined Douglas Products as Business Development Manager for APAC region in March 2023.
- ✓ Over 35 years experience in sales and Operations of Fumigation practices.
- ✓ Started with family Pest Control and Fumigation business, Exopest based in Brisbane.
- ✓ Previous since have held senior positions with Rentokil and Syngenta.
- ✓ Have been involved in all facets of fumigation from Biosecurity, structural – termites and food manufacturing, through to commodity fumigation.
- ✓ Have had dealings regarding fumigation from a local, national and global level.



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History of ProFume® gas fumigant



- ✓ Early 1950's - Research by The Dow Chemical Company for an alternative to methyl bromide (MB) for structural fumigation
- ✓ 1961 - Vikane® gas fumigant, sulfuryl fluoride (SF) as active ingredient, introduced to protect homes and structures from drywood termites and other pests
- ✓ Today - More than three million structures, including museums, cathedrals, historical landmarks, rare book libraries, and scientific and medical research laboratories, have been fumigated with Vikane to eradicate pests



Fumigation of Chemistry Research Building (39,600 m³) University of Florida, USA



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History of ProFume® gas fumigant



- ✓ 1995 - At the request of progressive food industries, Dow AgroSciences began investigation of sulfuryl fluoride as an alternative to methyl bromide for post-harvest insect control
- ✓ Dow AgroSciences formed partnerships with leading stored product researchers, fumigators, distributors and food industries around the world to develop ProFume® gas fumigant
- ✓ First registered in Australia in 2007.
- ✓ Initially created for use for the milling market.
- ✓ R&D has continued to develop since this time developing more specific to the pest and structure that is being fumigated and now being recognized as a reliable alternative to Methyl Bromide.



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Why use ProFume® Fumigant?



ProFume® fumigant:

- Controls all life stages of a broad range of insect and rodent pests.
- May be applied in a wide variety of locations such as: buildings (residential and commercial), timber, construction materials, furnishing, shipping containers, vehicles (excluding aircraft), surface ships, food/commodity storage facilities, food handling and commodity processing facilities, and fumigation chambers.
- May be used for quarantine applications using an approved treatment schedule.
- Is not cross-resistant with other fumigants and insecticides.



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Why use ProFume® Fumigant?



- Douglas Products provides on-going support for product use including:
 - Printed and electronically available resources to help you address customer questions and concerns.
 - Easily accessible resources for you.
 - Annual continuing education to keep you up to date on the latest technology and current regulations.



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Why use ProFume® Fumigant?



Dedicated Support Staff



David Marrs

Business Development Manager

- Contact with distributors
- On site training
- Contact for new geographies



Janet Rowley

International Business Leader

- Strategic Growth
- Project Manager
- Technical Support



Dr. Barb Nead-Nylander

Research Scientist

- Global Research & Development
- Entomologist
- Technical Support



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Why use ProFume® Fumigant?



Distributor Support in the Philippines



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Key Attributes of ProFume® fumigant



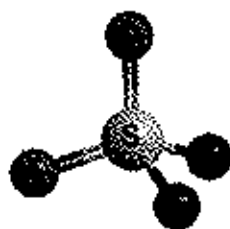
- Broad-spectrum, effective and reliable pest control
- Relatively Inert
- Non-flammable
- Excellent penetration and rapid aeration
- Packaged for easy handling, distribution and gas introduction



ProFume is a registered trademark of Douglas Products. It is a true gas, non-flammable, and non-toxic. It is used for pest control in a wide range of applications, including food storage, agriculture, and industrial settings.

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Physical Chemical Properties



Sulfuryl fluoride
SO₂F₂

Sulfuryl fluoride is a true gas.

- It is a gas at temperatures above -55°C.

Sulfuryl fluoride has a high vapour pressure.

- It evaporates 20,000 times more readily than moth balls.

These two factors mean that sulfuryl fluoride disperses quickly throughout treated spaces and commodities such as timbers and aerates quickly once it is no longer confined. Additionally, because sulfuryl fluoride is a gas at normal working temperatures, no heat exchanger is required.



ProFume is a registered trademark of Douglas Products. It is a true gas, non-flammable, and non-toxic. It is used for pest control in a wide range of applications, including food storage, agriculture, and industrial settings.

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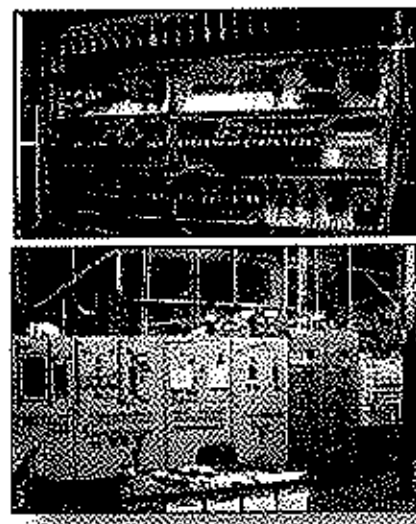
Physical Chemical Properties



Sulfuryl fluoride is relatively inert.

- It does not react with building or household contents and does not harm items that remain within a structure* undergoing fumigation.
- Sulfuryl fluoride has been used to eradicate pests infesting rare and preserved specimens, historical artifacts and from buildings containing expensive electronic equipment without issue.

*Food, feed, drugs, medicinals and tobacco products may not remain within a fumigated space unless specifically listed for direct fumigation or meeting specific requirements as listed in the labeling for ProFume® fumigant.



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Physical Chemical Properties



Sulfuryl fluoride is odourless, colourless and tasteless.

- No off-tastes or odors are present in tested commodities following a fumigation with sulfuryl fluoride.
- Sulfuryl fluoride has no warning properties.

Sulfuryl fluoride is non-irritating to the skin and eyes.

- Sulfuryl fluoride has no warning properties.



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Physical Chemical Properties



Sulfuryl fluoride has very low solubility in water.

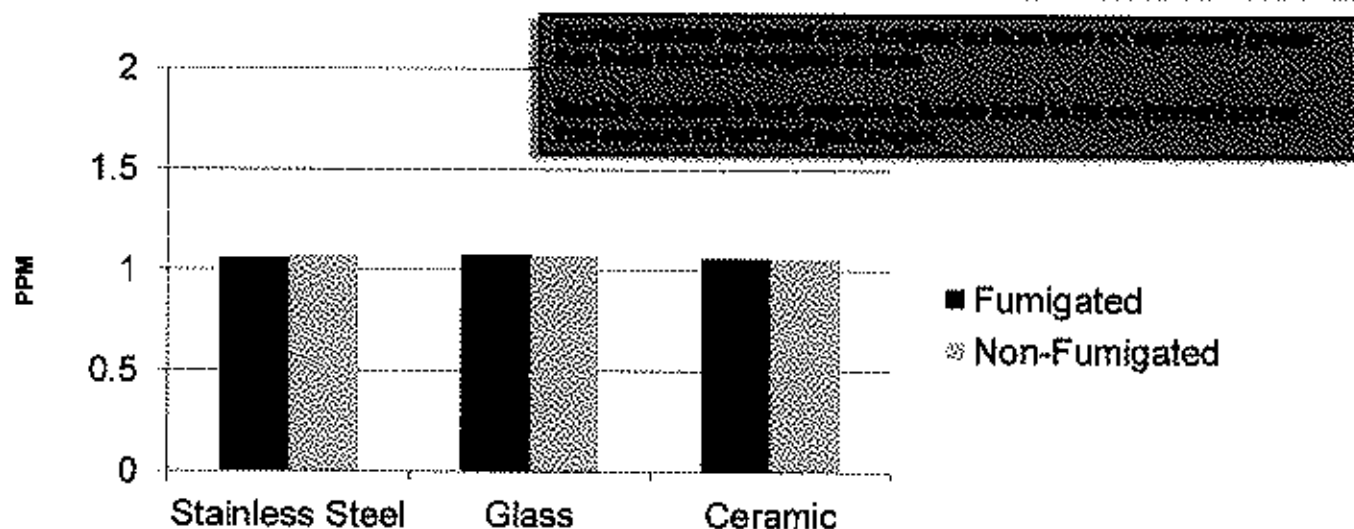
- Water can then be used to help create a barrier to retain the fumigant within the treated structure.
- Meaning that ships, barges etc. can be done on water and the surface of water can help create a barrier



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Journal of Internal Medicine 255: 105–112
DOI: 10.1111/j.1365-2796.2003.01999.x

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Fluoride Residue Recovered on Fumigated and Non-Fumigated Surfaces

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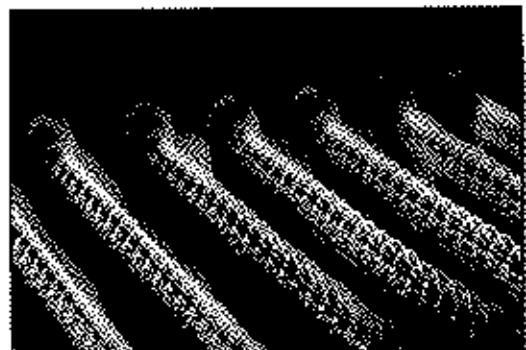
14

Key Attributes of ProFume[®] fumigant



ProFume is nonflammable and stable at normal temperatures.

- Under normal use conditions, sulfuryl fluoride will not ignite or explode.
- Open flames and heat sources should be extinguished prior to fumigation.



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Packaging of ProFume fumigant



- 99.8% sulfuryl fluoride
- Packaged as liquid under pressure
- 57 kg (125 lbs) in steel cylinders
- 12 cylinders per pallet
- All packaging materials (hardwood pallet, metal top collar, strap with ratchet buckles) are reusable and tested for shipping durability

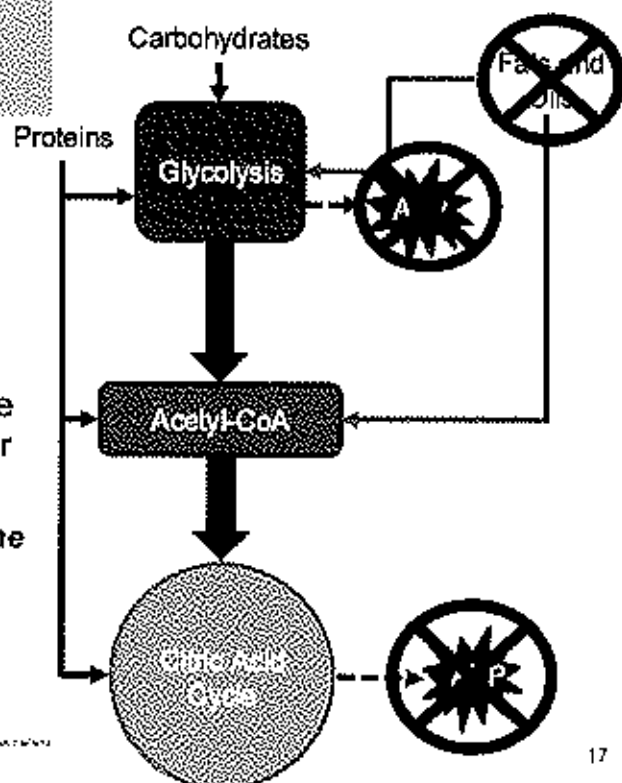


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Mode of Action

- Sulfuryl fluoride is a metabolic inhibitor.
- It prevents the metabolism of fats leading to a disruption of glycolysis and the citric acid cycle.
- This disruption results in the loss of energy production (ATP) and ultimately leads to death.
- Death isn't necessarily instantaneous, and some pests may survive for a short period of time after the fumigation is complete.
 - This is called **Latent Mortality**. However, *if the proper dosage was achieved*, they will die within a short period of time (hours to a few days).



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Pests Controlled



ProFume® fumigant is used to control all life stages (egg, larva, pupa and adult) of stored product pests, such as:

- | | |
|---|--|
| • Flour beetles (<i>Tribolium</i> spp.) | • Warehouse beetle (<i>Trogoderma variabile</i>) |
| • Hide Beetle (<i>Dermestes maculatus</i>) | • Grain weevil (<i>Sitophilus granarius</i>) |
| • Indianmeal moth (<i>Plodia interpunctella</i>) | • Rice weevil (<i>Sitophilus oryzae</i>) |
| • Mediterranean flour moth (<i>Ephestia kuehniella</i>) | • Rusty grain beetle (<i>Cryptolestes ferrugineus</i>) |
| • Dried fruit moth (<i>Ephestia cautella</i>) | • Lesser grain borer (<i>Rhyzopertha dominica</i>) |
| • Tobacco beetle (<i>Lasioderma serricorne</i>) | • Sawtoothed grain beetle (<i>Oryzaephilus surinamensis</i>) |
| • Drugstore beetle (<i>Stegobium paniceum</i>) | |



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Labelling: Pests



ProFume® fumigant is used to control all life stages (egg, larva, pupa and adult) of timber QPS pests, such as:

- **Drywood termites** (e.g., West Indian drywood termite (*Cryptotermes brevis*), *C. caryonis*, Western drywood termite (*Incisitermes minor*), and Light southeastern drywood termite (*I. snyderi*)).
- **Woodboring beetles** (e.g., Brown lyctus beetle (*Lyctus brunneus*), African powderpost beetle (*Lyctus africanus*), Anobiid powderpost beetle (*Euvrilletta peltata*), Old house borer (*Hylotrupes bajulus*), and the Bamboo borer (*Chlorophorus annularis*)).



West Indian Drywood Termite
(*Cryptotermes brevis*)



Powder Post Beetle
(*Lyctus brunneus*)



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Labelling: Pests

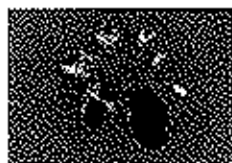


ProFume® fumigant is used to control all life stages (egg, larva, pupa and adult) of structural pests, such as:

- **Occasional Invaders for Fumigation**
- **Bed bugs** (*Cimex lectularius*).
- **Cockroaches** (e.g., German cockroach (*Blattella germanica*), American cockroach (*Periplaneta americana*), and Brown-banded cockroach (*Supella longipalpa*)).
- **Webbing clothes moth** (*Tineola bisselliella*); **Carpet beetles** (e.g., Black carpet beetle (*Attagenus unicolor*) and Furniture carpet beetle (*Anthrenus flavipes*)).
- **Pest rodents** including rats and mice.



American Cockroach
(*Periplaneta americana*)



Bed Bugs
(*Cimex lectularius*)



Rodents
(*rodentia*)



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Fumigation Sites



Sites that may be fumigated include:

- Stationary transportation vehicles including railcars, shipping containers, trucks, surface ships – aircraft or submarines may not be fumigated.
- Temporary and permanent fumigation chambers.
- Storage structures including warehouses, silos and bunkers.
- Timber and construction material may also be fumigated.



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QPS Treatments



- Profume® fumigant (SO_2F_2) is widely used as a quarantine and pre-shipment (QPS) fumigant to control pests.
- It is often used to replace methyl bromide (which is being phased out because of its ozone depletion effects).
- Common quarantine uses: Treating wood packaging (like pallets — ISPM 15 requirements). Treating stored products (grains, nuts, dried fruits). Treating buildings, cargo, and even plant products before international shipping.



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QPS Treatments

- o Many countries across the globe recognize ProFume® fumigant as an acceptable QPS pre or post shipment treatment schedule including countries within Europe, Africa, Asia, Oceania and North and South America.
- o It is favored in quarantine settings due to its fast action, leaving minimal residue, and because it has no significant impact on ozone depletion.
- o Rates should be sourced from the importing country to ensure compliance with the importing countries requirements.

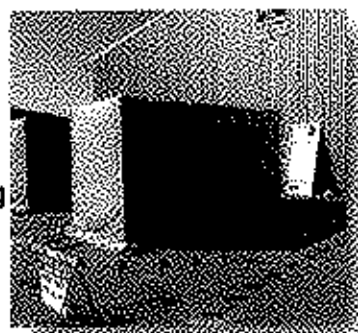


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Container Fumigation

- When fumigating shipping containers for quarantine treatments, follow treatment schedule requirements regarding:
 - o Sealing (vents and door seals or tarping)
 - o Fumigation introduction (rate)
 - o Monitoring
 - o Aeration and clearance testing
- Shipping containers must be placed in a location appropriate for conducting fumigations
- Insert introduction hose through the door seals into the headspace of the shipping container
- Introduction fans can also be used to assist in aeration of the container
 - o **REMEMBER** to allow time for desorption – check fumigant levels in free airspace **AND** within the commodity



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Container Fumigation



- Container required to be either sheeted or sealed by sealing air vents
- Vents can be sealed with tape



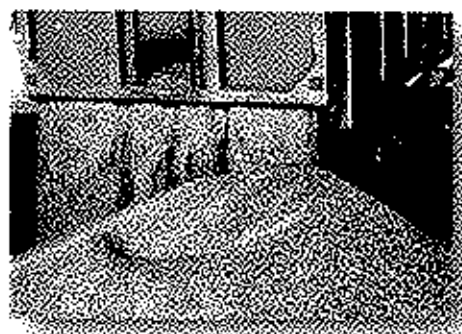
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Stationary Vehicle Fumigation



- Trailers, trucks, etc. may be fumigated with ProFume® fumigant, but **all aeration** procedures must be completed **before** they are transported
- Trailers on chassis should be secured by **setting the brakes** and **blocking the wheels** to prevent movement during the fumigation
- Stationary vehicles should be prepared and sealed following general fumigation, tarpaulin and tape sealing instructions



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Ship Fumigation

- Surface ships and barges may be fumigated with ProFume® fumigant, but **all aeration** procedures must be completed **before** these vessels are allowed to sail
- The vessel must **not be moved** during fumigation and aeration periods
- If re-entry is necessary before aeration is completed, **SCBA** must be worn
- **Submarines may not be fumigated**



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Some Countries set there own methodologies

China example of requirement for fumigation of logs being exported into China.

Methyl Bromide Requirements

Temp, °C	Exposure, hours	Dosage, g/m ³	Observed and targeted concentrations (g/m ³) of methyl bromide							
			Start (equilibrium has established - difference in all the three readings must be within 15%)		2 hours after fumigation		16 hours after fumigation		24 hours (end of fumigation)	
			Top	Middle	Bottom	Target	Top	Middle	Bottom	Target
18 or above	24	80				26.7				24
10-15	24	120				40.2				36

As you can see, Methyl Bromide rates are higher for a specific temperature range when compared to those of ProFume® fumigant.

Sulfuryl Fluoride Requirements

Temp, °C	Exposure, hours	Dosage, g/m ³	Observed and targeted concentrations (g/m ³) of sulfuryl fluoride							
			Start (equilibrium has established - difference in all the three readings must be within 15%)		2 hours after fumigation		16 hours after fumigation		24 hours (end of fumigation)	
			Top	Middle	Bottom	Target	Top	Middle	Bottom	Target
>10	24	80				73				82
5-10	24	104				102				44



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Analysis of QPS Treatments



Attribute	ProFume® Gas Fumigant	Methyl Bromide	Heat
Nil Damage to commodities	✓	Multiple commodities where damage or concerns can be caused when using MB	Multiple commodities where damage or concerns can be caused when using heat at these temperatures
Low Sorption	✓ Due to rapid aeration Means quicker turnaround of goods	Slow aeration due to high sorption qualities	Not Applicable
Not Flammable or combustible	✓	Flammable in the presence of high energy ignition, combustible at concentrations of 10-15%	Possibility of ignition when producing extreme heat
No Document Pest Resistance	✓	Resistance Documented	Resistance Documented
Ease of setup and use	✓	Heat Exchanger Required to produce gas	Large Heater and heat monitors can be difficult to set up with requirement for electric outlets
Can I fumigate at temperatures of 5° C and higher?	✓	No typical regulations you can only fumigate to a minimum of 10 degrees Celsius	



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Methyl Bromide Possible Commodity Damage



Commodity	Notes
1. Foodstuffs: a) Butter, lard and tallow b) Cereals and materials with sodium hydroxide c) Full fat wheaten flour, whole wheat flour, other high protein flours and baking powders d) Milk with high oil content e) Certain feeding pellets, seeds, rice, oil, bladders, or other foodstuffs containing moisture f) Eggs, eggs	Never exceed the recommended dosage or exposure periods for food or foodstuff commodities.
2. Leather Goods	Permanently discolours leather goods treated with sulphur compounds. Caution should be used in the fumigation of leather goods.
3. Woolfats	Woolfats which have been treated as woolfats, greasy, shorn and worn.
4. Photographic chemicals	Developing solutions, fixers, etc.
5. Papers: a) Paper containing papers b) Certain writing and other papers coated by sulphur compounds c) Photographic films d) Carbonless carbon paper e) Silencing papers	
6. Rubber Goods: a) Foam rubber, such as car seat cushions, pillows, cushions, mattresses, and some car seats b) Rubber slabs and other similar forms of natural rubber	
7. Oil	
8. Fats	
9. Plastics	Permanently discolours plastics.
10. Chemicals, similar blocks and other similar forms	
11. Horsehair and hair	
12. Oil seed cakes	
13. Sulphuric acid	
14. Colours	
15. Colours, dyes and pigments	

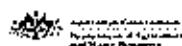
Source: AU DEPARTMENT OF AGRICULTURE, GUIDE TO PERFORM QPS FUMIGATIONS WITH METHYL BROMIDE.



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Additional Resources



Sulphuryl fluoride fumigation methodology

Version 1.0



<https://www.agriculture.gov.au/>



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ISPM 15 & 28 – Annex 22



Requirements are for sulphuryl fluoride fumigation of debarked wood

The treatments are for the control of regulated pests on regulated articles, primarily those moving in international trade. The adopted treatments provide the minimum requirements necessary to control a regulated pest at a stated efficacy. The scope of this standard does not include issues related to pesticide registration or other domestic requirements for approval of treatments (e.g. irradiation).

Fumigation of debarked wood using sulphuryl fluoride to reduce the risk of introduction and spread of insect pests.

For use of the sulphuryl fluoride treatment schedule, debarked wood must meet the following standards:

- Debarked wood not exceeding 20 cm in cross-section at its smallest dimension and
- 75% moisture content (dry basis) dimension.



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ISPM 28 – Annex 22



Sulphuryl fluoride fumigation in debarked wood

Temperature (°C)	Minimum required CT (g·h/m ³)	Minimum concentration (g/m ³)
15 or above	3200	93
20 or above	2300	87
25 or above	1600	44
30 or above	1400	41

This treatment schedule is effective against all wood-borne life stages of insect pests. There is 95% confidence that the treatment according to this schedule achieves the following levels of mortality for the wood-borne life stages of the following insect pests:

- Anoplophora glabripennis* (larvae and pupae) to not less than 99.99983%.
- Anobium punctatum* (all life stages) to not less than 99.7462%.
- Arthropos trisds* (all life stages) to not less than 99%.

The measured temperature of the product (including at the wood core) or the ambient air (whichever is lower) is used to calculate the sulphuryl fluoride dose and must be at least 16°C throughout the duration of the treatment.

Ref: ISPM 28 Annex 22 Sulphuryl fluoride fumigation (approved for use in debarked wood) (2017) Rome, IPPC, FAO
Published online and updated: 2017-04

Proforma

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ISPM 28 – Annex 22



One example of a schedule that may be used for achieving the specified requirements is shown below.

Temperature (°C)	Minimum required CT (g·h/m ³)	IF Dose ¹ (g/m ³)	Minimum concentration (g/m ³) at:				
			0.5 h	2 h	4 h	12 h	24 h
10 or above	3200	143	168	175	183	191	83
20 or above	2300	131	158	128	116	90	87
25 or above	1600	58	94	81	74	62	44
30 or above	1400	82	87	78	73	58	41

¹ Initial doses may need to be higher in conditions of high sorption or leakage.

If the CT is not achieved within a single 24-hour period (even if the minimum concentration is achieved), corrective action will need to be taken. The treatment may be extended for a maximum of two hours without adding more sulphuryl fluoride, or it may be restarted.

When requiring phytosanitary treatments for imports, contracting parties should take into account the following points:

- Phytosanitary measures required by a contracting party shall be technically justified.
- Phytosanitary treatments contained in annexes of this standard have the status of an ISPM and therefore should be considered accordingly. Regulatory regimes of exporting contracting parties may prevent certain treatments from being approved for

Proforma

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Example of treatment with Profume for QPS

<u>Timber</u>		<u>Raw Commodity</u>	
Step	Detail	Step	Detail
Fumigant	Sulfuryl fluoride (SO ₂ F ₂)	Commodity	Dried fruits, nuts (e.g., almonds, pistachios), grains (e.g., wheat, rice)
Target	Wood packaging materials (pallets, crates)	Target Pests	Stored-product pests — e.g., Indian meal moth, Khapra beetle, grain borers
Minimum Temperature	Typically, $\geq 21^{\circ}\text{C}$ (70°F) during fumigation	Temperature Range	Minimum 20°C (68°F) — efficacy drops if cooler
Exposure Time	Minimum 24 hours (can vary 24–48h)	Dosage	16–31 g/m ³ depending on temperature, exposure time, and pest
Concentration × Time (CT Product)	1500–2000 g·h/m ³ (grams × hours per cubic meter)	Exposure Time	12 to 24 hours (varies by pest & treatment design)
Dosage	Start around 48–64 g/m ³ initial concentration	CT (Concentration × Time) Target CT:	500–1500 g·h/m ³
Monitoring	Concentration monitored at regular intervals (e.g., 1, 2, 4, 24h) to ensure CT is achieved	Sealing	Airtight enclosure or fumigation chamber required (tarp or containerized)
Post-fumigation	Aerate until gas concentration is below safe thresholds (per worker safety guidelines)	Gas Monitoring	Measure concentrations at 1, 4, 8, and final hour to ensure sufficient CT
Stamping	After treatment, the wood is marked with the IPPC HT stamp (even though it's a fumigation, they use the same mark with a special code).	Aeration	Ventilation required until SO ₂ F ₂ and fluoride residue levels drop below limits



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Sulfuryl fluoride (SO₂F₂) is a fumigant. Trepanier of Douglas Products is not responsible for the use of this product in any way that is not intended. Trepanier of Douglas Products is not responsible for the use of this product in any way that is not intended. Trepanier of Douglas Products is not responsible for the use of this product in any way that is not intended.

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Advantages of using Profume® Fumigant

- Penetrates deeply into materials.
- Effective against all life stages of insects (eggs, larvae, adults).
- Leaves minimal residues compared to other fumigants.
- No ozone depletion.



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Internationally Recognized



- FAO/IPPC (International Plant Protection Convention): Recognizes sulfuryl fluoride as an option for quarantine fumigation.
- ISPM 28: Lists sulfuryl fluoride as an approved treatment option under certain conditions for wood and commodities.
- Countries like USA, Australia, New Zealand, Asia, and parts of the EU accept sulfuryl fluoride for quarantine treatment.



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Stewardship – ProFume® fumigant



- Stewardship of ProFume is critical to its continued successful use in a safe manner
- Douglas Products takes stewardship of ProFume seriously
- Douglas Products, Fumigators and Distributors all play a role in the stewardship of ProFume
- Douglas Products has requirements that Fumigators and Distributors must meet to continue to use/sell ProFume



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Stewardship – ProFume® Fumigant



- Initial training reviews the following:
 - Physical properties of SF
 - Required personal protective equipment
 - Symptoms of overexposure, first aid
 - Cylinder handling
 - Treatment sites
 - Monitoring and clearance detection equipment
 - Dosage calculation – Fumigulda™
 - Site preparation
 - Fumigant introduction
 - Aeration
 - Site specific procedures



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Stewardship – ProFume® Fumigant



- Annual Stewardship Training Includes
 - Review of Stewardship Policy
 - Review of Routes of Exposure, PPE, and Emergency Response
 - Review of Cylinder Handling Requirements
 - Label and Regulatory Updates
 - Topics to Address Areas of Interest, New Uses, New Techniques, etc.



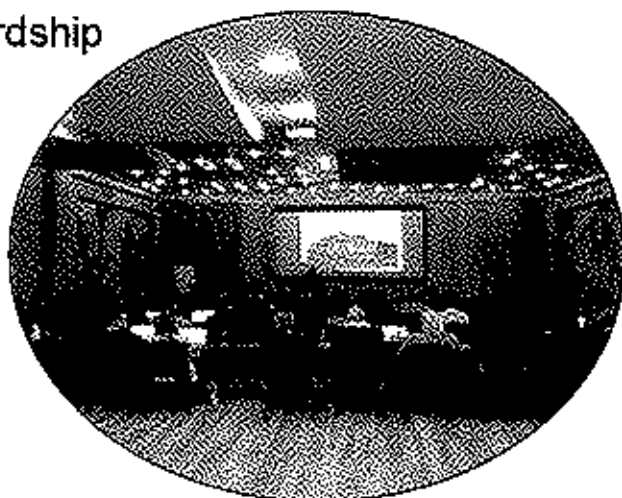
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ProFume® Fumigant Stewardship Training

Douglas Products as part of our Stewardship Program for ProFume® Fumigant:

- Provides training for product usage
- Ensures you know the proper PPE and equipment required for fumigation with ProFume
- Supports efforts for accreditation



41 ®™ Trademark of Douglas Products

ProFume® Fumigant Summary



- QPS Fumigation:
- ProFume® fumigant is a chemical fumigant used in QPS treatments to control pests within imported goods and commodities. This helps prevent the introduction and spread of harmful organisms into a country.
- Methyl bromide was a widely used fumigant, but it was phased out due to its ozone-depleting properties
- In a lot of countries specific sulfuryl fluoride fumigation methodology is followed to ensure effective and safe treatments
- While timber is a major application, sulfuryl fluoride can also be used on other commodities like grain, packaging materials, and also Brown Marmorated Stink Bug (BMSB) control



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Conclusion

Are there any
final questions?



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Mobile Plant Food Safety Laboratory: Bringing Food Safety Services Closer to Farmers



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Plant Product Safety Services Division
Bureau of Plant Industry

Plant Product Safety Services Division



Intensify the monitoring
system of pesticide
residues to assure the
supply of safe food for the
consumers

"towards a more responsive and
resilient food safety regulatory system
sustaining the production and availability
of safe agri-fishery products for Filipinos"

Ensure safety of fresh and minimally
processed plant foods consistent with
the Republic Act No. 10611 – Food
Safety Act of 2013, + RA 12078
+ RA 12022

SPAL - Negros

Central Office

SPAL
Cebu

SPAL
Cagayan
de Oro

SPAL - Davao

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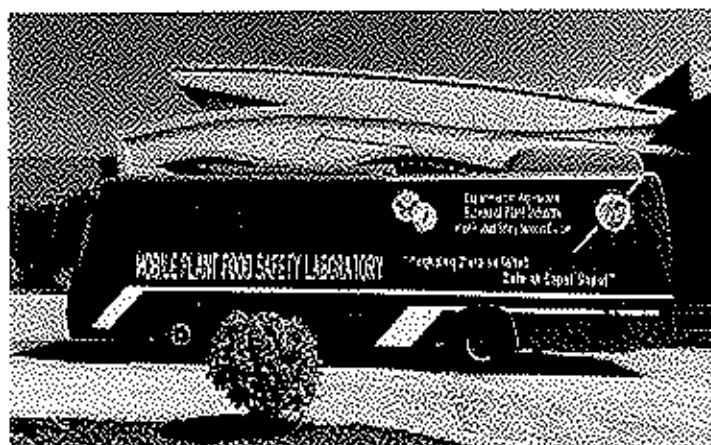


Laboratory-in-a-Bus

Mobile Plant Food Safety Laboratory is a cutting-edge initiative to safeguard public health and promote food safety nationwide.

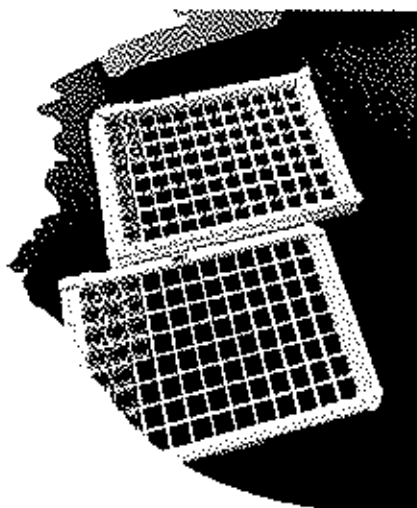
With advanced technology and a flexible modular setup, it conducts vital food safety testing

Extends critical testing services to remote and underserved areas, bridging gaps in food safety management and bringing government services closer to the farmers and other stakeholders.



**Mobile
Laboratory
Innovation
on the
Move**



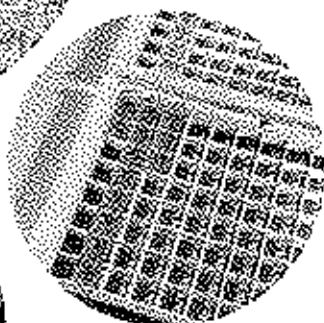
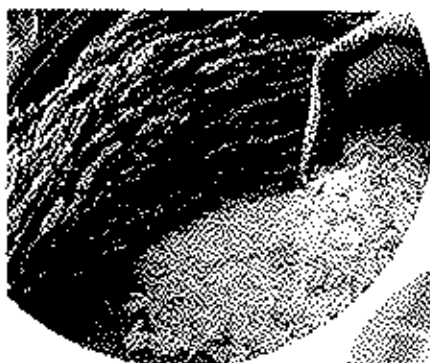


Pesticide Residue Screening

Utilizes 800 TS Agilent BioTek microplate enzyme-linked immunosorbent assay (ELISA) reader

Screening Parameter: Organophosphates, Carbamates, Pyrethroids

ABRAXIS® Organophosphate/Carbamate (OP/C),
Pyrethroids (Py) Plate, 96-test



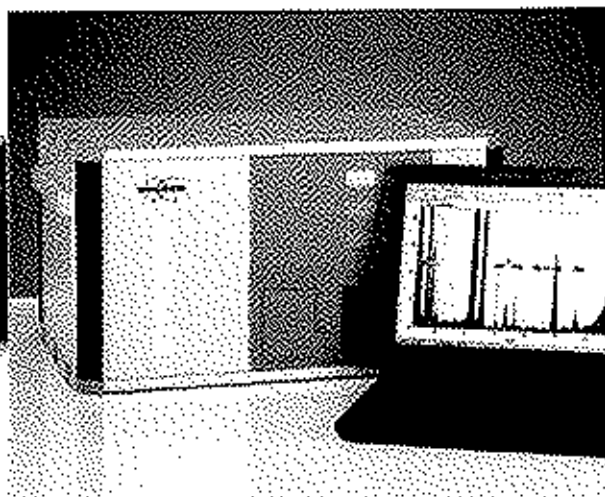
Mycotoxin Screening

Utilizes 800 TS Agilent BioTek microplate enzyme-linked immunosorbent assay (ELISA) reader

Screening Parameter: Aflatoxin B1, Total
Aflatoxin, Ochratoxin A

RIDASCREEN® Aflatoxin Total, Aflatoxin B1
30/15, Ochratoxin A





Heavy Metals Screening

Utilizes S2 PICOFOX total reflection X-ray fluorescence spectroscopy (TXRF) for quantitative and semi-quantitative multi-element microanalysis

Screening Parameter: Arsenic, Lead, Cadmium



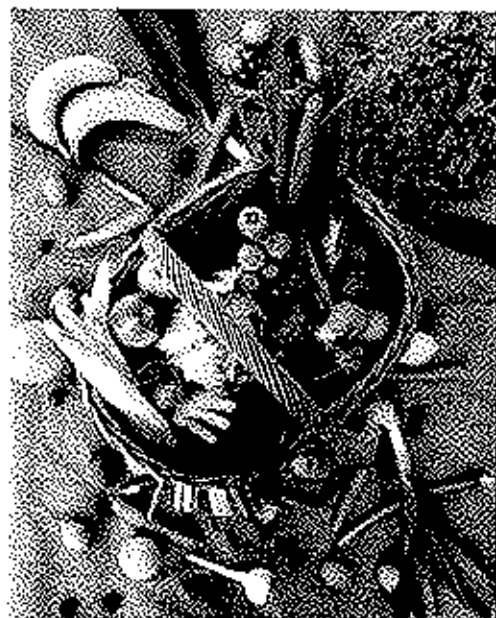
Microbiological Contaminants Analysis

Utilizes RIDA®CYCLER multiplex real-time Polymerase Chain Reaction (RT-PCR) instrument

Screening parameter: *Escherichia coli*,
Listeria monocytogenes, *Salmonella* spp.

SureFast® PREP Bacteria,
SureFast® Foodborne Pathogen 4plex





Mobile Laboratory Operations: Sample Analysis Summary

Total Samples analyzed: **386 agricultural crops**
(143 commodities from FY 2024)
(243 commodities as of April 2025)

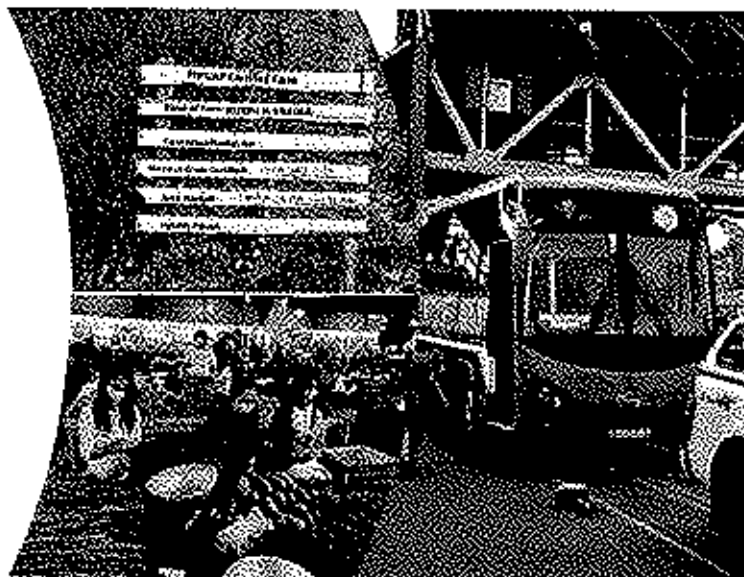
Commodities: local and imported rice, P29 rice, P45 rice, onions, mangoes, carrots, celery, calamansi, onion leeks, cabbage, lettuce, pechay, rice, peanuts, tomato, eggplant, ampalaya, string beans, and mango

Sources: Public Market, Kadiwa Market, Farms, Rice Mills



Mobile Laboratory Operations: Milestones

- ✓ With a capacity of 30 samples per day and reduced transportation delays, test result delivery from 3 days to just 1 day
- ✓ Ensure food safety of crops sold in Kadiwa Stores and Public Markets
- ✓ Used in parallel analysis in detection of Lead in smuggled rice
- ✓ Participate in 2024 PhilGAP Summit in Baybay, Leyte
- ✓ Provide technical support of Food Safety Awareness Trainings in Quezon Province, Bonguet and Nueva Ecija
- ✓ Laboratory support for PhilGAP Certification



Mobile Laboratory Operations: Sample Detection

39 crops (10%) with detection of food safety contaminants

Screening Food Safety Parameters	Food/crops
Pesticide Residue	tomato, amplaya, pechay, papaya, banana, rice, peanut, strawberry (OP/C. Py)
Mycotoxin	rice (aflatoxin total)
Heavy Metals	rice (As)
Microbiological Contaminants	water spinach, carrot, pechay, calamansi, onion (<i>Salmonella</i> spp.), pechay (<i>E.coli</i>)



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Mobile Laboratory Operations: Budgetary Requirements

Procurement Cost of 1 unit Mobile Laboratory

Articles	Amount
Mobile Bus (fabrication & modification)	10,000,000.00
Equipment (15,000,000.00)	
ELISA (pesticide residue, mycotoxin analysis)	1,000,000.00
XRF (heavy metals analysis)	3,500,000.00
RT PCR (microbiological contaminants)	4,500,000.00
Other laboratory equipment (centrifuge, water purification system, vortex mixer, robocoupe, laboratory grinder, autoclave, biosafety cabinet, laboratory table, top loading balance, freeze dryer, freezer)	6,000,000.00
Operational Cost (4,000,000.00)	
Chemicals & Filtering	2,000,000.00
Traveling Expenses	1,000,000.00
Fuel Expenses	1,000,000.00
TOTAL	29,000,000.00

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Mobile Laboratory Operations: Budgetary Requirements

Operational Cost

Analysis	Cost per sample	Remarks
Pesticide Residue	3,000.00	Organophosphates kits, carbamates kits, pyrethroids kits, chemicals and supplies required to conduct testing
Heavy Metals	1,500.00	Standards, chemicals and supplies required to conduct testing
Mycotoxin	2,500.00	Ochratoxin kits, aflatoxin kits, chemicals and supplies required to conduct testing
Microbiological Contaminants	7,000.00	Foodborne Pathogens 4plex kits, salmonella kits, E. coli kits, listeria kits, chemicals and supplies required to conduct testing
Total amount	14,000.00	(cost per sample analyzed with 4 food safety testing)

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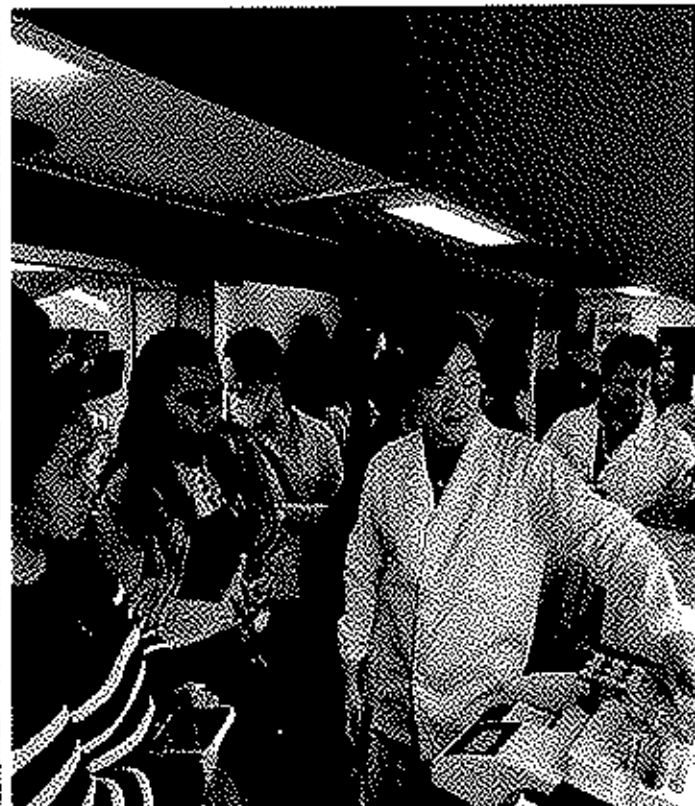
Mobile Laboratory Operations: Budgetary Requirements

Comparison of Operational Cost (Mobile Laboratory vs PPSSD Laboratory)

Analysis	Mobile Laboratory	PPSSD Laboratory (based on proposed revised rate of fees)	Remarks
Pesticide Residue	3,000.00	6,500.00	Mobile Laboratory: qualitative analysis PPSSD Laboratory: qualitative & quantitative analysis
Heavy Metals	1,500.00	3,500.00	Mobile Laboratory: qualitative analysis PPSSD Laboratory: qualitative & quantitative analysis
Mycotoxin	2,500.00	3,500.00	Mobile Laboratory: qualitative analysis of aflatoxin and ochratoxin PPSSD Laboratory: qualitative & quantitative analysis of aflatoxin only
Microbiological Contaminants	7,000.00	4,000.00	Mobile Laboratory: qualitative analysis of salmonella, E. coli, listeria monocytogenes PPSSD Laboratory: qualitative & quantitative analysis of salmonella, E. coli
Total	14,000.00	17,500.00	

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Plant Product Safety Services Division**

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Phytosanitary Diagnostic Services of the BPI-NPQSD

Darwin M. Landicho, Ph.D.
Supervising Agriculturist / Laboratory Head
Central Laboratory
 National Plant Quarantine Services Division
 Department of Agriculture - Bureau of Plant Industry

Managing Agriculture, Animal and Fisheries



National Plant Quarantine Services Division

- Division under the Bureau of Plant Industry (BPI) mandated to enforce Plant Quarantine laws and regulations.
- BPI serves as the **National Plant Protection Organization (NPPO)** of the Philippines
- member of the **International Plant Protection Convention (IPPC)**



NPQSD Central Laboratory

- Support the regulatory function of the NPQSD
- **Central Laboratory**, located in BPI Central Office serves as the center for **pest identification** and **standardization of diagnostic procedures**
- **Functions:**
 - Phytosanitary diagnostic testing
 - Laboratory capacity-building
 - Collaboration with stakeholders



NPQSD Central Laboratory

- **Oversee** the implementation of all laboratories of the NPQSD
- Functions as a **center for pest identification** and **standardization of diagnostic procedures**
- **Develop new procedures** for pest detection
- **Provide accurate and timely identification** of pests to be used as the basis for any quarantine actions or decisions
- **Collaborate** with experts/scientists in providing technical assistance on matters related to different plant pest groups
- **Evaluate the needs** and prepare an action plan for the **development/improvement** of each of the laboratory

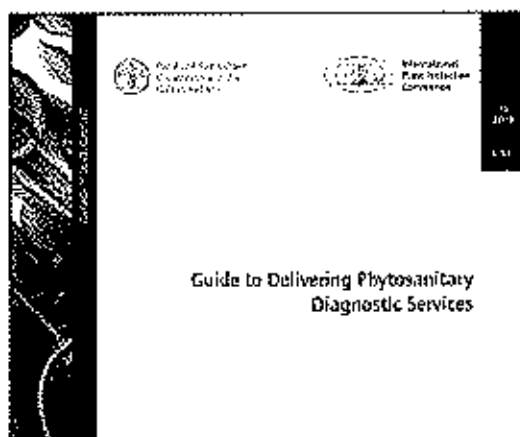
*BPI M.O. NO. 222, S. 2022



PHYTOSANITARY DIAGNOSTICS: WHY IT MATTERS



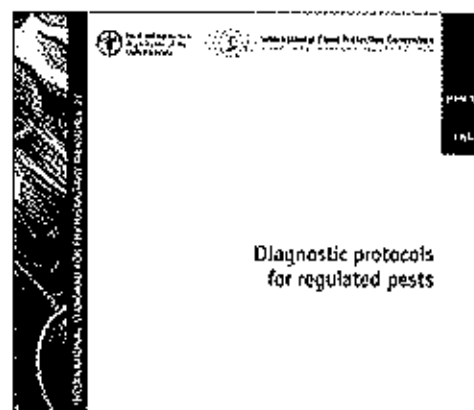
Phytosanitary Diagnostics Why it matters?



- essential for the **fulfillment of obligations and responsibilities** under the IPPC
- Fundamental to **science-based phytosanitary measures**
- Accurate pest information **requires the diagnosis** of pest identity
- The ability to offer **accurate and timely** diagnostic services and to **report** on the results of such diagnoses is an *important function of NPPO*

Importance of Phytosanitary Diagnostics

The NPPO, as required by ISPM, is responsible to “perform” or otherwise “authorize” plant pest identification services that support national plant pest surveillance or surveys.



<https://openknowledge.fao.org/server/api/core/bitstreams/a51257cb-2d5d-400e-ae5b-53e71cca1627/content>

NPPO responsibilities and obligations that rely on diagnostics:



Pest risk analysis (IPPC Article IV.2(f); ISPMs 2 and 11)

provide essential information to clarify which specific pest risks need to be analyzed



Establishment of appropriate phytosanitary import measures (Article VII; ISPM 20)

measures should be based on pest risk analysis - should be supported by diagnostics



Import verification (Article VII; ISPM 20), Inspection (Article VII; ISPM 20) and Notification of non-compliance (Article VII; ISPM 13)

essential to ensure the accurate identity of the pest intercepted



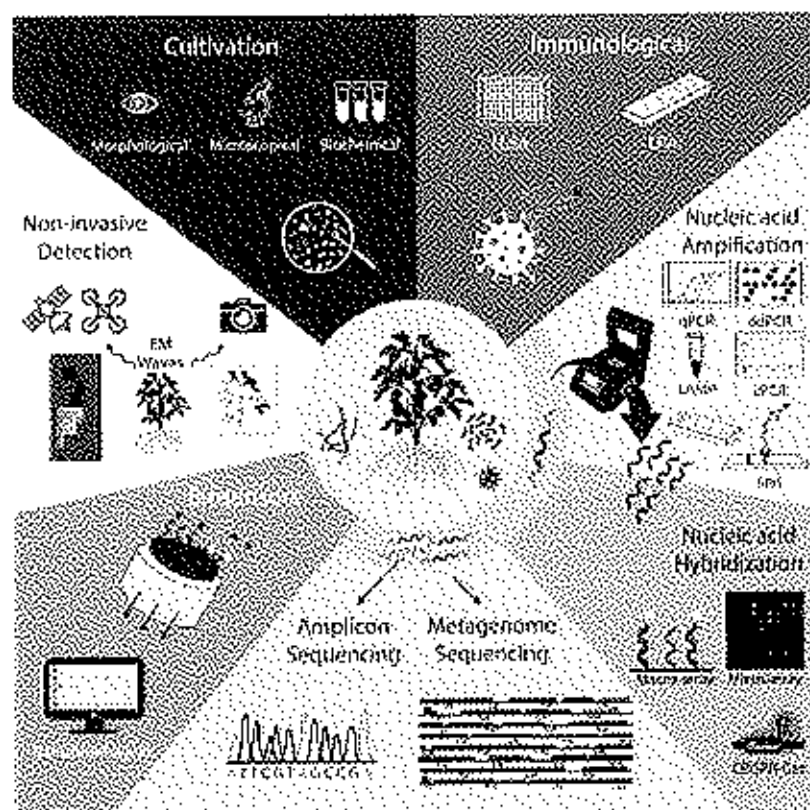
Surveillance (Article VII.2(j); ISPM 6)

- o diagnostics provide essential information on organisms collected through specific surveys
- o to provide accurate information on pest status (Article VII.2(j); ISPM 8)
- o contributes to regulator actions such as inclusion of pests on lists of regulated pests (ISPM 19) and pest reporting (ISPM 17).

NPOSD Functional Chart



<https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2023.1120968/full>



Current phytosanitary diagnostic capabilities of the BPI-NPQSD

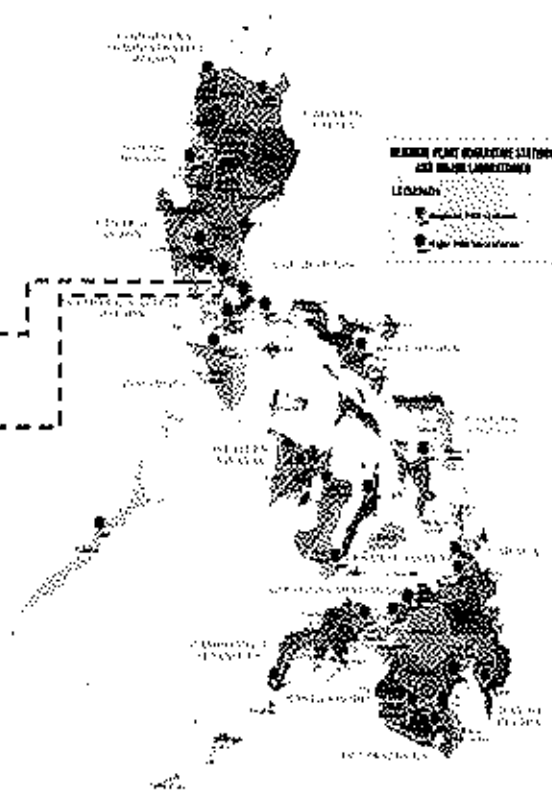
Molecular DNA Sequencing Nucleic Acid Amplification	Biological	<ul style="list-style-type: none"> • Morphological • Microscopic <ul style="list-style-type: none"> • Light microscopy • Remote microscopy • High-resolution digital microscopy (<i>future plan</i>) 	Arthropod pest, weeds, fungi, bacteria, and nematodes
	Serological	<ul style="list-style-type: none"> • Lateral flow immunoassay (LFI) • Enzyme-linked immunosorbent assay (ELISA) 	Bacteria and viruses
	End-point PCR	<ul style="list-style-type: none"> • End-point polymerase chain reaction (PCR) • Real-time PCR • Digital PCR 	Arthropod pest, fungi, bacteria and viruses
	Sequencing	<ul style="list-style-type: none"> • Sanger sequencing (DNA barcoding – outsourced/third-party) • Nanopore sequencing (<i>future plan</i>) 	Arthropod pest, fungi, bacteria and viruses

LABORATORY FACILITIES

*Morphological, serological, and molecular testing;
Confirmatory analysis*

Central Laboratory

**Central Post-Entry
Quarantine Station**

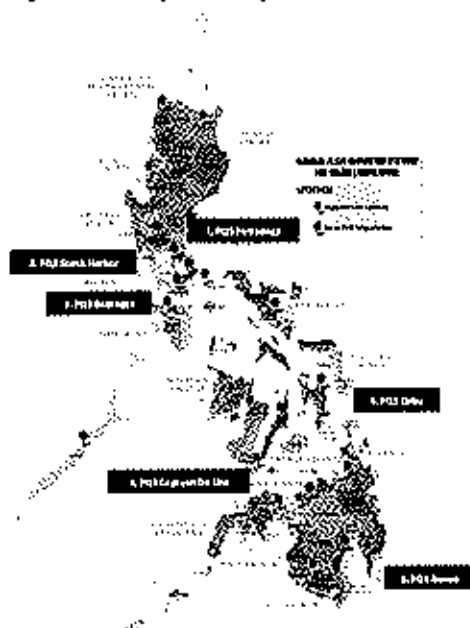


Routine morphological and microscopic examination (RMS)

– 6 Major PQS Laboratories (Major Ports: Pampanga, South Harbor, Batangas, Cebu, Cagayan De Oro, Davao)

– PQS Station Laboratories (Regions 1-13)

Remote microscopy system (RMS)



Laboratory workflow



LABORATORY DIAGNOSIS

Services offered:

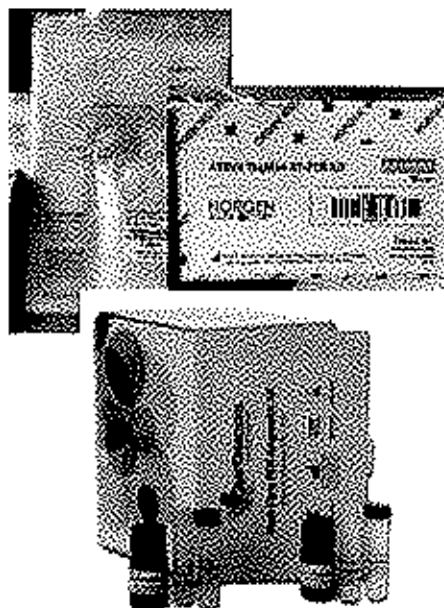
- **Visual examination**
 - Symptomatology
 - Macro testing/Dry seed inspection
- **Morphological identification of arthropod pest**
- **Pathogen isolation and Identification (fungi, bacteria, and nematodes)**
 - Blotter test
 - Baermann and oostenbrink method
 - Iodine starch test (HLB)
- **Serological testing (bacteria and viruses)**
 - Lateral flow immunoassay
 - Enzyme-linked immunosorbent assay (ELISA)
- **Molecular testing**
 - Polymerase chain reaction (PCR)
 - Molecular Identification/DNA barcoding



LABORATORY DIAGNOSIS

Serological and molecular diagnostic protocols:

- **Lateral strip test (Viruses and bacteria):**
 - Potyviruses, ORSV, TSWV, *R. solanacearum*, CTV, IYSV, ToBRFV, CymMV, MCMV, ToLCNDV, Aac, SqMV, PVA, PepMV, MDMV, CGMMV, Cmm
- **ELISA:**
 - Bacteria (*C. michiganensis*, *B. glumae*, *P. stewartii*, *A. avenae*)
 - Virus (TSV, TSWV, SqMV, TRV, MCMV, AMV)
- **PCR tests:**
 - Virus/Viroids/Bacteria: ASBVd, ToLCNDV, ToBRFV, *R. solanacearum*
 - Fungi: Specific (FocTR4, *Pestalotiopsis*, *Synchytrium*) and DNA barcoding
 - Insects: DNA Barcoding
- **GMO screening and event-specific detection (in collaboration with BPI Biotechnology Office)**

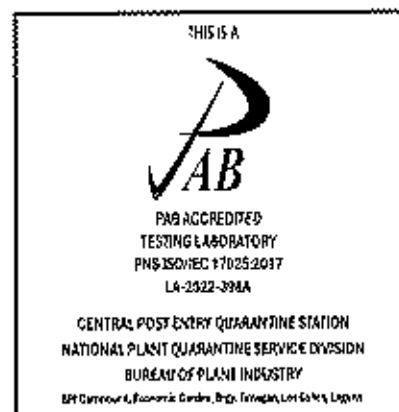


ISO 17025 accredited protocols for phytosanitary diagnosis

Central Post-Entry Quarantine Station

(PNS ISO/IEC 17025:2017 accredited)

- **Testing of Insect pests/diseases**
 - Morphological identification of fruit fly (*B. dorsalis*, *B. occipitalis*, *B. umbrasa*, *Z. cucurbitae*) Fruit Fly: Drew & Romig: Plant Health Australia
 - Detection of plant pathogen: *Aphelenchoides besseyi* using Modified Oostenbrink Method (EPPO Bulletin PM7/39 (2); ISTA 7-025)
- **Analysis of GMO**
 - Event-specific real-time PCR
 - Lateral flow Immunoassay (Cry1Ab/Ac, Cry1F, CP4-EPSPS, Cry2A)



Recent developments:

- Developed real-time PCR assay for the detection of *Ceratobasidium theobromae* in cassava - for diagnosis of Cassava witches' broom disease (previously thought to be caused by phytoplasma)
- Verified real-time PCR kit for *Fusarium oxysporum f.sp. cubense* Tropical Race 4 (FocTR4) in banana (ClearDetections®)
- Verified real-time PCR protocol for *Tomato spotted wilt virus* (TSWV) detection
- Verified PCR kit for *Tomato leaf curl New Delhi virus* (ToLCNDV)
- Verified real-time PCR assay for *Tomato brown rugose fruit virus* (ToBFRV)
- Verified lateral flow immunoassay for the detection of *Citrus tristeza virus* (CTV)

Other activities:



Laboratory training and capacity building



Collaboration with other institutions

Other activities:



Student Internships



Public information and education campaigns

Way forward

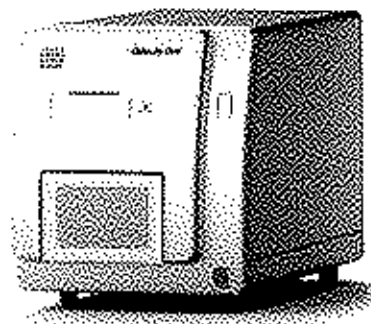
1. **Developing efficient and harmonized laboratory management systems for PQS laboratories.**
 - a. Standardized forms
 - b. Harmonized procedures
 - c. Efficient information management (improved lab reporting system, LIMS)
2. **Developing, validating, and verifying diagnostic protocols**
3. **Continuous training and collaboration with other institutions.**
4. **Enhance coordination and improve the capacities of PQS laboratories.**
5. **Obtaining additional ISO 17025 and ISO 9001 accreditation & accredited scope**



6. Adopting new technologies

a. Digital PCR

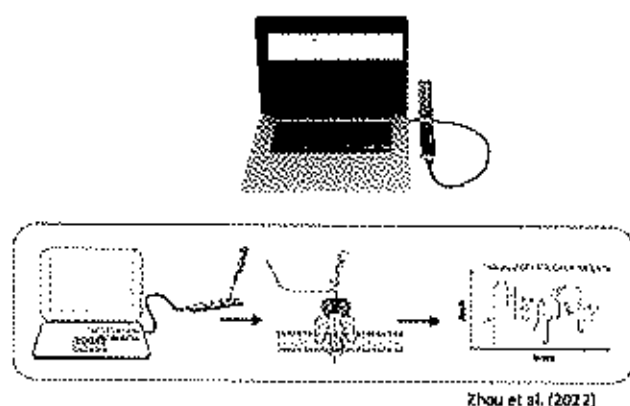
- For absolute quantification of target DNA
- Nanoplate-based system
- Extremely sensitive and simpler workflow



6. Adopting new technologies

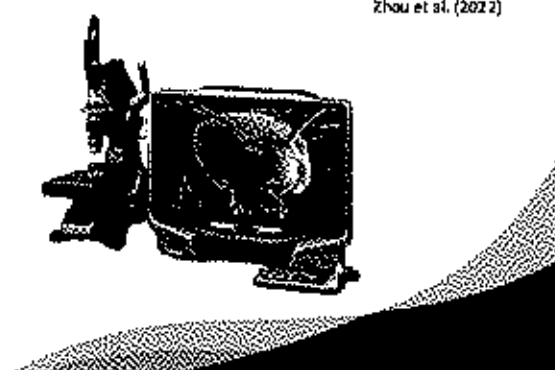
b. Next-generation sequencing (NGS) using MinION portable nanopore technology

- In-house DNA sequencing capability for molecular identification of insects, viruses, and fungal pathogens.
- Participated in capacity-building activity conducted by ARDN Project/Plant Innovation Center, DAFF, Australia)



c. High-resolution digital microscopy

- accurate morphological analysis



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- Food and Agriculture Organization of the United Nations. (2016). Guide to delivering phytosanitary diagnostic services. FAO. <https://openknowledge.fao.org/handle/20.500.14283/ca6374en>
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- Venbrux, M., Crauwels, S., & Redlers, H. (2023). Current and emerging trends in techniques for plant pathogen detection. *Frontiers in Plant Science*, 14, 1120968
- Zhou, Y., Ren, M., Zhang, P., Jiang, D., Yao, X., Luo, Y., ... & Wang, Y. (2022). Application of nanopore sequencing in the detection of foodborne microorganisms. *Nanomaterials*, 12(9), 1534.

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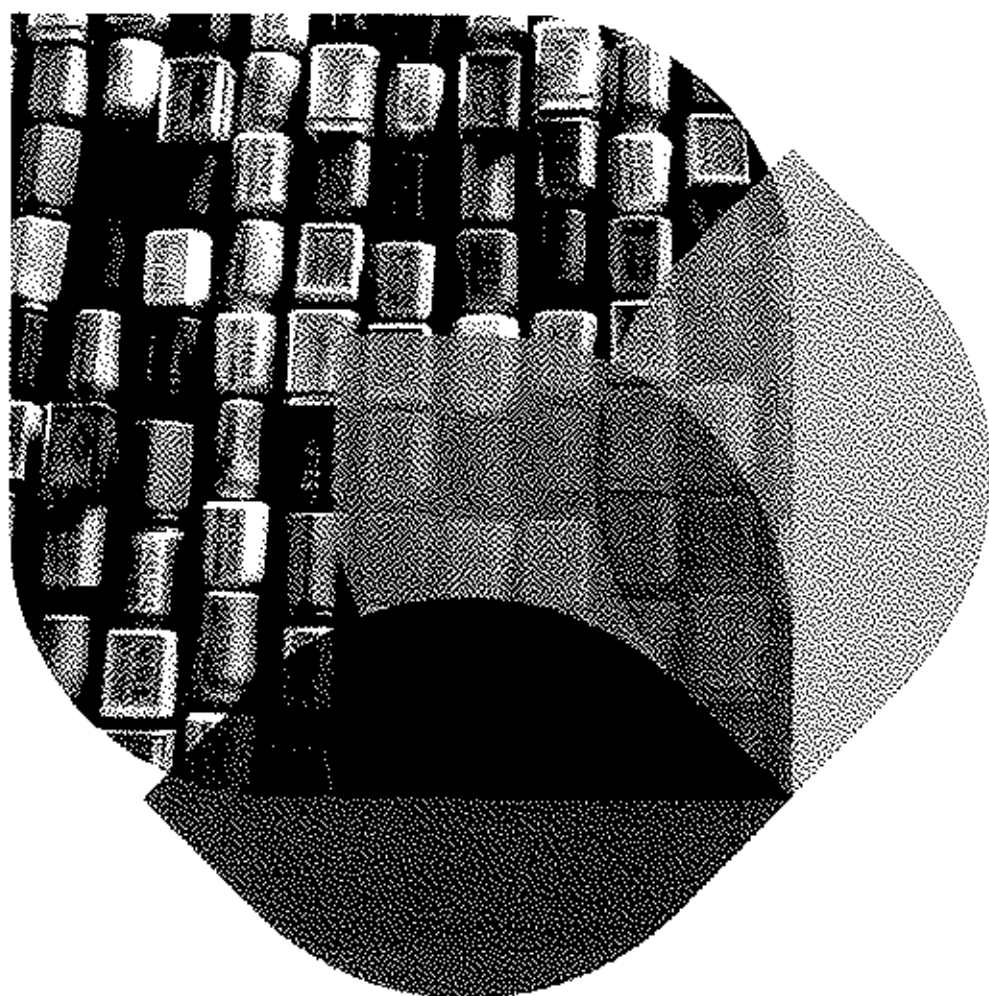
[NATIONAL PLANT QUARANTINE SERVICES DIVISION](#)



Thank you!

Methyl bromide fumigation methodology

Version 3.0



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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

Purpose

This methodology sets out the minimum requirements for treatment providers performing methyl bromide fumigations on import and export consignments for Quarantine and Pre-Shipment (QPS) purposes. Compliance auditing of treatment providers is performed against the requirements in this methodology to gain assurance QPS treatments are performed effectively.

Treatment providers required to perform fumigations in accordance with this methodology must have the:

- equipment
- facilities
- personnel and
- administrative procedures necessary to comply with these requirements.

Importing jurisdictions may impose more stringent treatment requirements to address specific biosecurity risks. In such cases, those additional requirements, referred to in this document as import conditions, take precedence over the requirements of this methodology and must be complied with to the satisfaction of the relevant authority of the importing jurisdiction.

General

All requirements in this methodology must be performed to ensure:

- target pests are killed
- the people performing the treatment remain safe and are not harmed
- all people in the area around the treatment area remain safe and are not harmed
- the goods or commodities being treated are not damaged or adversely affected.

Methyl bromide is listed as a category 1 ozone depleting substance under the Montreal Protocol 1992. Performing methyl bromide fumigations in accordance with these requirements will reduce the use of methyl bromide by minimising the need for re-treatment of consignments due to ineffective fumigations caused by poor fumigation practices.

Use and handling of methyl bromide must not contravene any instructions on the product label, safety data sheet, local regulations or relevant licence requirements.

How to use this document

This document outlines the minimum set of requirements for performing methyl bromide fumigation treatments.

The Guide to performing QPS fumigations with methyl bromide and Guide to packaging suitability for performing QPS treatments provide information that may assist in meeting these requirements in commonly encountered situations.

It is important treatment providers and compliance auditors understand the purpose of the requirements of this methodology, the outcomes they are intended to achieve and the circumstances in which they apply.

The technical terms used in this methodology are defined in the glossary. For all terms not defined in the glossary, refer to the definition used by the Macquarie Dictionary.

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1 Fumigator readiness

Note: Prior to fumigation the fumigator must ensure they have trained personnel, suitable equipment, and suitable site to conduct fumigations.

1.1 Fumigation personnel

- 1.1.1 The fumigator-in-charge must ensure the requirements of this methodology are complied with.
- 1.1.2 The fumigator-in-charge must comply with the treatment schedule, as set by the relevant authority, for the goods being treated.

1.2 Fumigation equipment

- 1.2.1 The equipment used for performing a fumigation must be fit for purpose and in good working order.
- 1.2.2 Electronic instruments used to measure temperature or methyl bromide concentration or to detect the presence of methyl bromide, must be calibrated and serviced in accordance with the manufacturer's instructions. If the manufacturer's instructions do not specify calibration frequency, equipment must be calibrated every 12 months.
- 1.2.3 Gas concentration measuring instruments must be fitted with any filters as specified by the manufacturer to suit the circumstances of the fumigation.
- 1.2.4 Equipment must be used in accordance with the manufacturer's instruction manual.
- 1.2.5 Temperature monitoring instruments must be accurate to within $\pm 1^{\circ}\text{C}$.

1.3 Site suitability

- 1.3.1 The fumigation site must:
 - a) have adequate space to establish an exclusion zone around the enclosure in accordance with section 5.1 Establish an exclusion zone; and
 - b) allow for safe ventilation; and
 - c) be on a flat and even surface; and
 - d) be well ventilated; and
 - e) have power available, either via mains or a generator.

2 Safety

Note: Local jurisdictions may have safety legislation and regulations that govern the safe performance of a fumigation. The requirements contained in Section 2 may differ from the local laws, the fumigator-in-charge must comply with the laws relevant to where the fumigation is being performed.

2.1 Safety considerations

- 2.1.1 If a fumigation is performed in a jurisdiction that does not have legislation or local regulations for the safe performance of a fumigation section 2 Safety applies.
- 2.1.2 Methyl bromide must be handled in a manner consistent with instructions on the product label, safety data sheet or relevant licence requirements.

2.2 Risk assessment

- 2.2.1 Before commencing fumigation, a risk assessment must be carried out to identify the risk of methyl bromide exposure to:
 - a) fumigation personnel; and
 - b) people in the vicinity; and
 - c) occupants of surrounding buildings.
- 2.2.2 Before commencing fumigation, safety measures must be put in place to minimise all the risks identified in the risk assessment. These safety measures must minimise the risk of methyl bromide exposure to:
 - a) fumigation personnel; and
 - b) people in the vicinity; and
 - c) occupants of surrounding buildings.

2.3 Personal protective equipment (PPE)

- 2.3.1 Respiratory protection equipment must be worn, at all times, by any person inside the exclusion zone, including during ventilation, from the time of injecting methyl bromide into the fumigation enclosure until the threshold limit value (TLV) is achieved.
- 2.3.2 Full-face respirators must be:
 - a) operated in accordance with the manufacturer's instructions; and
 - b) fitted with a gas filter canister suitable for use with methyl bromide and replaced in accordance with the manufacturer's instructions; and
 - c) maintained in accordance with the manufacturer's instructions, with all valves clean and intact; and
 - d) able to form an airtight seal against the face of the fumigator.
- 2.3.3 Self-contained breathing apparatus must be:
 - a) operated in accordance with the manufacturer's instructions; and
 - b) used only by properly trained personnel; and
 - c) maintained in good working order and in accordance with the manufacturer's instructions.

3 Consignment suitability

3.1 Target of fumigation

Note: The fumigator-in-charge must determine if the consignment and target of fumigation is suitable for fumigation with methyl bromide. To be considered suitable, consignments must meet the requirements of section 3 Consignment suitability.

- 3.1.1 The fumigator must record the target of fumigation on the record of fumigation (see section 12 Documentation).
- 3.1.2 If the consignment is not suitable for fumigation, remedial action must be taken to make the consignment suitable prior to fumigation. If the consignment cannot be made suitable, the consignment must not be fumigated with methyl bromide.
- 3.1.3 If the target of fumigation includes the exterior of a sea container, the fumigation must be performed as a sheeted enclosure in accordance with section 4.2 Sheeted enclosures or otherwise made suitable for fumigation.
- 3.1.4 If the target of fumigation is inside a sea container, and the sea container is not sufficiently gas tight (in accordance with Section 4.1 All Enclosures), the fumigation must be performed as a sheeted enclosure in accordance with section 4.2 Sheeted enclosures or otherwise made suitable for fumigation.

3.2 Impermeable packaging, wrappings and surface coatings

- 3.2.1 The target of fumigation must not be covered by impermeable packaging, wrapping or surface coatings that impede methyl bromide distribution.
- 3.2.2 Impermeable packaging and wrappings that impede methyl bromide distribution or impede methyl bromide penetration into the target of fumigation must be removed, opened, slashed or made pervious prior to fumigation in accordance with the specifications set out at 3.2.3 and 3.2.4.
- 3.2.3 To be considered pervious, wrappings must have at least:
 - a) 4 holes of 6 mm diameter per 100 mm x 100 mm surface area, or
 - b) 5 holes of 5 mm diameter per 100 mm x 100 mm surface area, or
 - c) 6 pinholes per 10 mm x 10 mm surface area.
- 3.2.4 Pervious wrappings must be in a single layer, so the perforations are not blocked by the wrapping overlapping itself.
- 3.2.5 If penetration into the target of fumigation is required, the target of fumigation must not be coated in materials that may impede penetration of methyl bromide into the target of fumigation (for example: lacquers, paints, waxes, natural oils, veneers or plastic wraps).

3.3 Requirements for perishable commodity packaging

3.3.1 Section 3.3 requirements apply to perishable commodities.

Note: If the target of fumigation is in impermeable packaging, the impermeable packaging must be removed, opened or made pervious in accordance with section 3.2, impermeable packaging, wrappings and surface coatings prior to fumigation.

3.3.2 Cartons must allow for methyl bromide to be distributed within the cartons and reach the target of fumigation.

3.3.3 To achieve the requirement under 3.3.2, prior to fumigation, all cartons must:

- a) be opened or have lids removed, or
- b) have holes created in the cartons that allow distribution of methyl bromide into the cartons and reach the target of fumigation (holes may be covered with insect-proof mesh).

3.3.4 Cartons must be arranged in a way that does not block holes or impede methyl bromide distribution.

3.3.5 All packaging material associated with consignments must be fumigated in accordance with the treatment schedule specific to the consignment.

3.4 Load factor requirements for perishable commodity fumigations

3.4.1 Section 3.4 requirements apply to perishable commodities.

3.4.2 If the target of the fumigation is a perishable commodity, and the treatment schedule does not specify load factor requirements, the following load factor requirements apply:

- a) A maximum load factor of 80%.
- b) Packages must be placed on pallets or raised off the ground by at least 100 mm by other means.

3.5 Requirements for timber

3.5.1 Section 3.5 requirements apply to timber and timber products.

Note: If the target of fumigation is timber, the methyl bromide must be able to penetrate every part of the timber. The accepted depth that methyl bromide can penetrate into timber is 100 mm from the surface of the timber.

3.5.2 If the target of the fumigation is uncoated timber, all internal points within the timber must be no greater than 100 mm from a surface of the timber.

3.5.3 If the target of fumigation is timber coated with an impermeable material the timber must:

- a) have one uncoated surface no more than 100 mm from the coated surface, or
- b) be fumigated before any impermeable surface coatings are applied.

3.5.4 Individual timber products must be separated by a minimum of 5 mm every 200 mm to create space for fumigant penetration along the entire length of the timber. This separation can be horizontal or vertical.

4 Fumigation enclosures

4.1 All enclosures

4.1.1 All fumigation enclosures must be:

- a) sufficiently gas-tight to retain the methyl bromide for the duration of the exposure period; and
- b) prepared to safely inject and ventilate methyl bromide; and
- c) sealed to minimise methyl bromide escape; and
- d) prepared to ensure even methyl bromide distribution throughout the enclosure and the target of fumigation; and
- e) monitored for temperature if applicable.

4.1.2 Each individual enclosure is a separate fumigation and must be recorded on its own record of fumigation.

4.2 Sheeted enclosures

4.2.1 Section 4.2 requirements apply to sheeted enclosures.

4.2.2 Surfaces on which sheeted enclosures are constructed must be impermeable to methyl bromide or covered with a gas-proof sheet to make it impermeable.

4.2.3 Fumigation sheets must be weighed down to seal it against the surface and hold it securely in place. The seal must be:

- a) created using materials that can follow the contour of the surface; and
- b) arranged so there are no gaps or breaks in the seal around the entire enclosure.

4.2.4 All sea containers fumigated in a sheeted enclosure must have at least one door fully open during the fumigation.

4.2.5 If multiple sea containers are fumigated in a sheeted enclosure the fumigation must be monitored in accordance with section 5.3 Gas concentration monitoring locations.

4.3 Fumigation chambers

4.3.1 Section 4.3 requirements apply to fumigation chambers.

4.3.2 A fumigation chamber must:

- a) be permanently sealed along all joints between the walls, ceiling and floor; and

- b) be gas-tight once the door is closed without the need to use tape, sealant, sand snakes or any other means; and
- c) not have anything, such as concentration sampling tubes, supply pipes or electrical leads, enter the chamber that will interfere with the seal; and
- d) have an inbuilt extraction system that actively removes methyl bromide from the enclosure; and
- e) pass a pressure test at least every six months in accordance with section 4.4 Pressure testing a fumigation chamber.

4.4 Pressure testing a fumigation chamber

- 4.4.1 Pressure testing must be performed with all concentration sampling tubes, supply pipes and electrical leads in place as they would be for fumigation.
- 4.4.2 To perform a pressure test, the pressure within the enclosure must be raised by 250 pascals (Pa) relative to atmospheric pressure. To pass the pressure test, it must take 10 seconds or more for the pressure in the enclosure to fall from 200 Pa to 100 Pa relative to atmospheric pressure.
- 4.4.3 If the pressure falls from 200 Pa to 100 Pa in less than 10 seconds, the enclosure has not passed the pressure test and an exclusion zone must be maintained throughout the exposure period in accordance with section 5.1 Establish an exclusion zone.
- 4.4.4 A record of the pressure test must be completed for every pressure test and kept for a minimum of two years.
- 4.4.5 All following information must be recorded on a record of pressure test:
 - a) Location – the site address where the pressure test is performed.
 - b) Chamber identification details.
 - c) Time and date the pressure test is performed.
 - d) The name and signature of the person who performed the pressure test.
 - e) The time taken for the pressure in the enclosure to fall from 200 Pa to 100 Pa.
- 4.4.6 A record of pressure test must be completed accurately.

4.5 Vacuum chamber

- 4.5.1 Section 4.5 requirements apply to vacuum chambers.
- 4.5.2 A vacuum chamber must be capable of attaining an initial vacuum of at least 660 mmHg, equivalent to 88 kPa.
- 4.5.3 Once methyl bromide has been injected, the resulting vacuum pressure must be maintained without further extraction of gas from the chamber for the duration of the exposure period.
- 4.5.4 The exposure period for fumigations performed in a vacuum chamber starts at the completion of methyl bromide injection into the chamber.
- 4.5.5 Temperature and pressure must be monitored within the chamber for the duration of the treatment.

5 Preparing to fumigate

5.1 Establish an exclusion zone

Note: Local jurisdictions may have safety legislation and regulations that govern the safe performance of a fumigation. The requirements contained in Section 5.1 may differ from the local laws, the fumigator-in-charge must comply with the laws relevant to where the fumigation is being performed.

- 5.1.1 An exclusion zone must be established around the fumigation enclosure and equipment used for methyl bromide injection.
- 5.1.2 The exclusion zone must have a physical barrier at all points where the enclosure is accessible.
- 5.1.3 The exclusion zone barrier must be in place when the exclusion zone is in force.
- 5.1.4 The exclusion zone barrier must have warning signs that:
 - a) are visible from all angles of approach; and
 - b) display symbols indicating danger and/or toxic gas is in use; and
 - c) are in a language spoken by staff at the fumigation site.
- 5.1.5 The size of the exclusion zone must not be less than:
 - a) 3 metres from the enclosure, if the enclosure is located outdoors, or
 - b) 6 metres from the enclosure, if the enclosure is located inside a building or structure.
- 5.1.6 The exclusion zone must be in force from immediately prior to methyl bromide injection and until the enclosure has been ventilated and the methyl bromide concentration is verified at or below the TLV in accordance with section 11, Ventilating the fumigation enclosure.
- 5.1.7 If the enclosure is a fumigation chamber, compliant with section 4.3 Fumigation chambers, or a vacuum chamber, compliant with section 4.5 Vacuum chamber, the exclusion zone may be removed once the methyl bromide has been injected and the doors are locked.
- 5.1.8 If the exclusion zone is removed in accordance with requirement 5.1.7, the exclusion zone must be re-established prior to ventilation and remain in-place until the methyl bromide concentration is verified at or below the TLV in accordance with section 11, Ventilating the fumigation enclosure.

5.2 Gas concentration monitoring equipment

- 5.2.1 Gas concentration monitoring equipment must be able to detect methyl bromide concentrations within the treatment dose range for all treatment schedules applied and be in good working order.
- 5.2.2 Gas concentration monitoring instrument must be operated, calibrated and serviced according to the manufacturer's instructions.

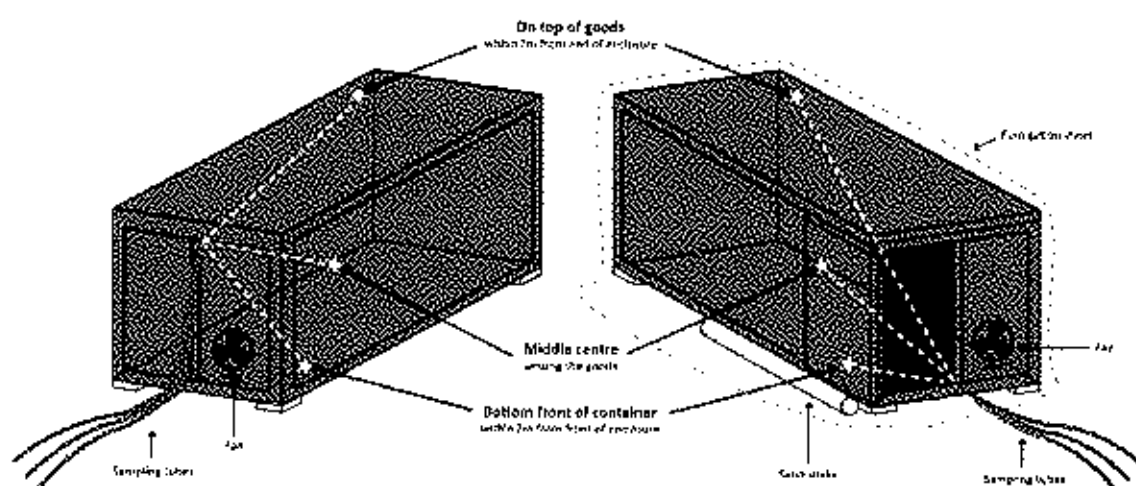
- 5.2.3 If using concentration sampling tubes that extend outside the enclosure, each concentration sampling tube must:
- be clearly identified according to their location within the enclosure; and
 - be free from kinks and blockages; and
 - be of a diameter suitable to fit the inlet of the concentration measuring instrument.
- 5.2.4 If gas concentration monitoring instruments are placed within the enclosure each instrument must:
- allow for readings to be read outside of the exclusion zone; and
 - be clearly identified according to their location within the enclosure.

5.3 Gas concentration monitoring locations

Note: Section 5.3 does not apply to perishable commodities. See section 5.4 for gas concentration location requirements for perishable commodities.

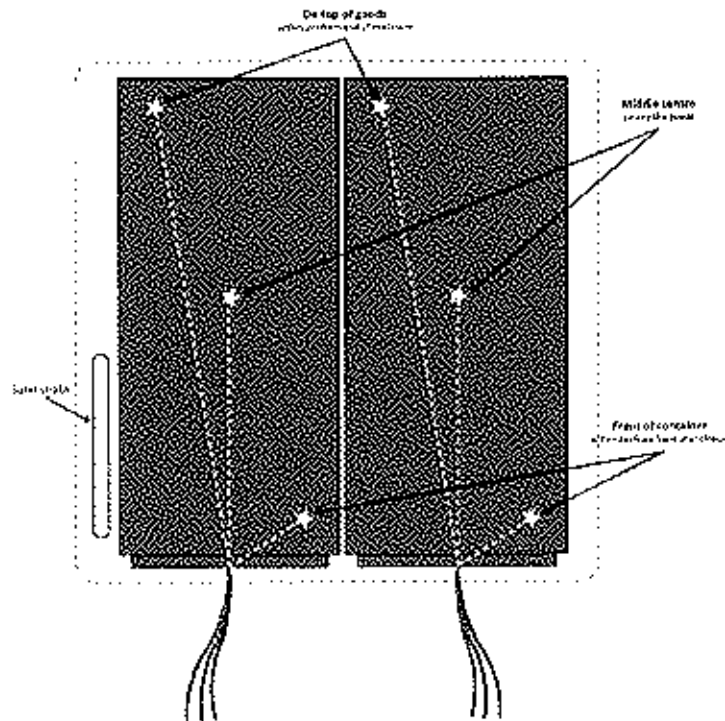
- 5.3.1 Enclosures less than 30 m³ in volume must have at least one gas concentration monitoring location. The monitoring location must be on the top-centre of the goods.
- 5.3.2 Enclosures equal to or greater than 30 m³ in volume must have at least three gas concentration monitoring locations. The monitoring locations must be:
- on top of the goods within 2 metres of the end of the enclosure; and
 - no more than 250 mm above the floor of the enclosure and within 2 metres of the opposite end from the top gas concentration monitoring location; and
 - in the middle centre of the enclosure among the goods and at least 2 metres from the other gas concentration monitoring locations.

Figure 1 Monitoring locations for a sheeted enclosure with one sea container



- 5.3.3 If a sheeted enclosure contains multiple sea containers, each sea container must have at least three gas concentration monitoring locations in accordance with requirement 5.3.2.

Figure 2 Monitoring locations for a sheeted enclosure with more than one sea container

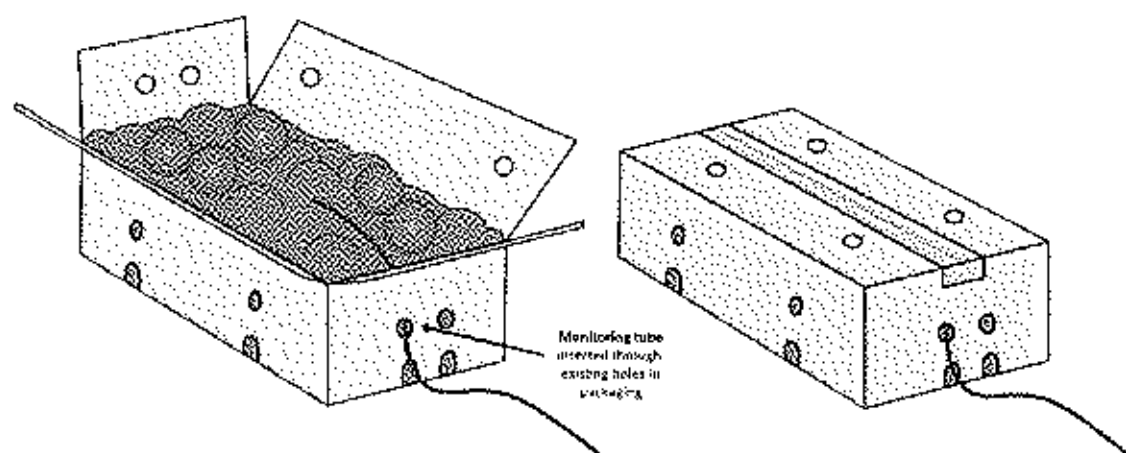


- 5.3.4 Additional gas concentration monitoring locations must be used if mandated by import conditions.

5.4 Gas concentration monitoring locations – perishable commodities

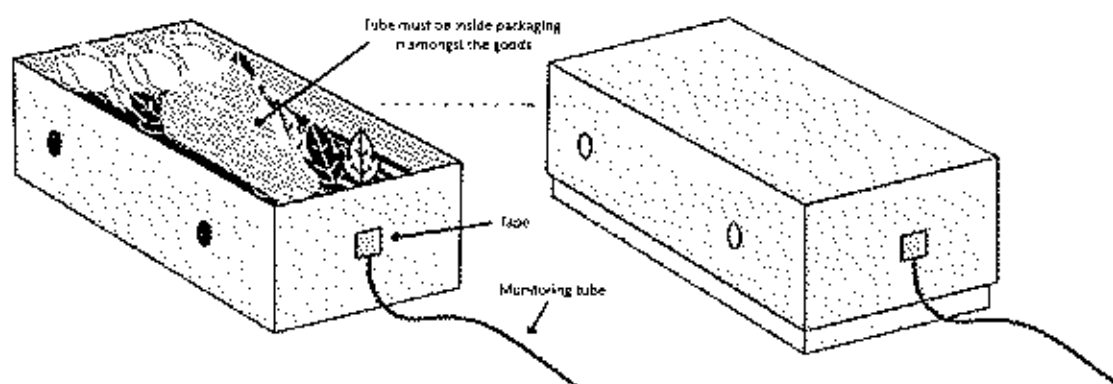
- 5.4.1 Section 5.4 requirements apply to perishable commodity fumigations.
- 5.4.2 If there is one type of commodity and packaging, and the total enclosure volume is less than 5 m³ the gas concentration must be monitored in at least one location. The gas concentration monitoring location must be inside a carton:
- in the centre of the stack, or
 - in the middle of the enclosure, if the cartons are not stacked.
- 5.4.3 If the enclosure is equal to or greater than 5 m³ in volume the gas concentration must be monitored in at least three locations. The gas concentration monitoring locations must be inside a carton:
- at the top of a stack within 2 metres of the end of the enclosure; and
 - no more than 250 mm above the floor of the enclosure and within 2 metres of the opposite end from the top gas concentration monitoring location, and
 - in the middle centre of the enclosure halfway up a stack.
- 5.4.4 If the target of fumigation is packaged inside one or more layers of packaging, the gas concentration monitoring locations must be located inside the packaging next to the target of fumigation.

Figure 3 Monitoring locations in a perishable fruit package



- 5.4.5 If the target of fumigation is cut flowers, leaf, stem material or bulbs imported as nursery stock, the gas concentration monitoring location must be located within the bunch in the middle of a carton.

Figure 4 Monitoring locations in a package of cut flowers



- 5.4.6 The placement and installation of gas concentration monitoring equipment within cartons or packaging must not change the gas penetration properties of the carton or package.
- 5.4.7 If there are different types of packaging in the consignment, there must be one gas concentration monitoring location inside each of the different packaging types. The minimum number of monitoring locations and position of the monitoring locations must be in accordance with section 5.4.3. If there are more than three different types of packaging, the number of gas monitoring locations must be the same as the number of different packaging types.
- 5.4.8 Additional concentration monitoring locations must be used if mandated by import conditions.

5.5 Temperature monitoring instrument locations

- 5.5.1 Section 5.5 requirements apply to perishable commodity fumigations and controlled temperature fumigations.

- 5.5.2 The temperature of the enclosure must be monitored with a digital thermometer in at least one location within the enclosure.
- 5.5.3 If heaters are used, the temperature monitoring instruments must be placed within the enclosure as far away as practical from the heat source.
- 5.5.4 Temperature monitoring instruments must:
 - a) allow for readings to be read outside of the exclusion zone; and
 - b) be identified.

5.6 Methyl bromide supply pipes

- 5.6.1 If a sheeted enclosure contains multiple sea containers, at least one supply pipe must be placed in each sea container.
- 5.6.2 For sheeted enclosure fumigations, the supply pipes must be left in position for the duration of the exposure period.
- 5.6.3 Supply pipes left in place must be sealed once the methyl bromide has been injected.

5.7 Heaters and fans

- 5.7.1 If fans are used to circulate the gas, enclosures must have at least one fan for each 100 m³ of volume or part thereof.
- 5.7.2 Multiple sea containers fumigated in a single enclosure must have at least one fan placed in each container.
- 5.7.3 If heaters are used, they must be positioned in such a way to raise and maintain the air temperature throughout the entire enclosure above the treatment temperature used for the dose calculation.

6 Temperature used to calculate the dose

6.1 Ambient temperature fumigations

- 6.1.1 Section 6.1 requirements apply to ambient temperature fumigations.
- 6.1.2 A weather forecast for the location closest to the fumigation site must be obtained from a verifiable weather source to determine the forecast temperature during the fumigation exposure period.
- 6.1.3 The lowest forecast minimum temperature for the exposure period must be used to calculate the dose as specified in section 8.2 Calculating the dose.
- 6.1.4 The forecast minimum temperature must be sourced no earlier than the previous day of the start of exposure period and a record of the source of the information must be retained with the fumigation documentation.
- 6.1.5 The forecast minimum temperature must be recorded on the record of fumigation.

Note: If the ambient temperature is forecast to be 10°C or lower the fumigation cannot be performed as an ambient temperature fumigation. The temperature of the enclosure will need to be raised and maintained meaning the controlled temperature fumigation requirements will apply.

6.2 Controlled temperature fumigations

- 6.2.1 Section 6.2 requirements apply to controlled temperature fumigations.
- 6.2.2 The minimum temperature within the enclosure during the exposure period must be predicted. This predicted temperature must be used to calculate the dose in accordance with section 8.2 Calculating the dose.

6.3 Perishable commodity fumigations

- 6.3.1 Section 6.3 requirements apply to perishable commodity fumigations.
- 6.3.2 Dose calculations must be based on the core temperature specified in the treatment schedule.
- 6.3.3 Prior to applying the dose:
- a) the fumigator must measure the core temperature of the goods; and
 - b) the core temperature of the goods must be at or above the temperature specified in the treatment schedule.
- 6.3.4 The minimum number of temperature readings required in 6.3.3 is the same as the number of concentration monitoring locations required in section 5.4 Gas concentration monitoring locations – perishable commodities.
- 6.3.5 Temperature readings must be obtained:
- a) from the same positions as the concentration monitoring locations, or
 - b) with at least one temperature reading from each different type of perishable commodity within the enclosure.
- 6.3.6 If the target of fumigation is fruit or vegetables, the pulp temperature must be measured. The temperature measuring instrument must be:
- a) inserted into the centre of the fruit or vegetable, or adjacent to the pit; and
 - b) covering the whole temperature instrument probe (multiple pieces of fruit may be inserted onto the instrument if the fruit is small); and
 - c) placed into the largest sized commodity in mixed consignments; and
 - d) placed in the middle of the carton.
- 6.3.7 If the target of fumigation is cut flowers, leaf, stem material or bulbs imported as nursery stock, temperature readings must be placed within the bunch in the middle of a carton.
- 6.3.8 Dose compensation for temperature variation does not apply to perishable commodities unless specified by the treatment schedule.

- 6.3.9 If the treatment schedule allows dose compensation for temperature variation, the temperature used for dose compensation must be the lowest of:
- a) the temperature of the goods, or
 - b) the expected minimum temperature within the enclosure during the exposure period and compliant with section 6.1 Ambient temperature fumigations or 6.2 Controlled temperature fumigations.

7 Temperature during the exposure period

7.1 Ambient temperature fumigations

- 7.1.1 Section 7.1 requirements apply to ambient temperature fumigations.
- 7.1.2 The minimum ambient temperature must be obtained using:
- a) a verifiable weather source, or
 - b) temperature monitoring equipment compliant with section 1.2 Fumigation equipment.
- 7.1.3 During the exposure period:
- a) the minimum temperature must be equal to or above the temperature used for dosing, or
 - b) if dose calculations for temperature variation is permitted and the minimum temperature is above 10°C, all concentration readings must be equal to or above the standard concentration requirements in Appendix 4: Methyl bromide monitoring tables for the minimum temperature obtained.

Note: If the temperature obtained during the exposure period is equal to or below 10°C the fumigation has failed.

7.2 Controlled temperature fumigations

- 7.2.1 Section 7.2 requirements apply to controlled temperature fumigations.
- 7.2.2 The temperature within the enclosure must be monitored with a minimum of one temperature instrument.
- 7.2.3 The temperature within the enclosure must be monitored and recorded at least once every 15 minutes for the entirety of the exposure period. These records must be retained with the fumigation documentation.
- 7.2.4 The temperatures recorded within the enclosure during the exposure period must be equal to or above the temperature used for dosing.
- 7.2.5 The minimum temperature recorded within the enclosure during the exposure period must be recorded on the record of fumigation.

7.3 Perishable commodity fumigations

- 7.3.1 Section 7.3 requirements apply to perishable commodity fumigations.
- 7.3.2 The temperature of the enclosure must be monitored and recorded at least once every 15 minutes for the entirety of the exposure period. These records must be retained with the fumigation documentation.
- 7.3.3 The temperatures recorded during the exposure period, including enclosure temperature and all core/pulp temperatures, must be equal to or above the temperature used for dosing.
- 7.3.4 The minimum temperature of the goods achieved for the exposure period must be recorded on the record of fumigation.

8 Performing the fumigation

8.1 Dose rate compensation for temperature variation

- 8.1.1 If the treatment schedule or import conditions allow dose compensation for temperature variation, and the enclosure temperature is expected to fall below the temperature specified in the treatment schedule, the dose rate may be adjusted to compensate for the lower temperature.
- 8.1.2 If the treatment schedule allows dose compensation for temperature variation (in accordance with requirement 8.1.1), and the treatment schedule does not specify dose compensation requirements, the following calculation must be used: for each 5°C, or part thereof, the temperature is expected to fall below 21°C add 8 g/m³ to the prescribed dose rate.

8.2 Calculating the dose

- 8.2.1 The weight of methyl bromide needed to achieve the prescribed concentration must be calculated by multiplying the dose rate (temperature adjusted in accordance with section 8.1 Dose rate compensation for temperature variation) by the volume of the enclosure. The formula is:

$$\text{Dose (g)} = \text{Enclosure Volume (m}^3\text{)} \times \text{Dose Rate (g/m}^3\text{)}$$

- 8.2.2 If the fumigation is performed as a sheeted enclosure, the external dimensions of the enclosure must be measured prior to each fumigation and used to calculate the enclosure volume.
- 8.2.3 If the fumigation is performed in a fixed-sized enclosure, the internal dimensions of the enclosure must be used to calculate the enclosure volume.
- 8.2.4 If the methyl bromide is mixed with another gas, compensation must be made to the dose amount, so the full amount of methyl bromide required is injected into the enclosure. For methyl bromide supplied with 2% chloropicrin the formula is:

$$\text{Dose (g)} = (\text{Enclosure Volume (m}^3\text{)} \times \text{Dose Rate (g/m}^3\text{)}) \div 0.98$$

- 8.2.5 Once the dose has been calculated, the injected dose must be rounded up to the next increment that can be accurately measured by the equipment used to dispense methyl bromide. If methyl bromide is supplied in cans, the dose must be rounded up to the next full can.

8.3 Injecting methyl bromide into the fumigation enclosure

- 8.3.1 A vaporiser must be used when methyl bromide is injected into the enclosure. The vaporiser must maintain a water temperature of at least 65°C while the methyl bromide is being injected to the enclosure.
- 8.3.2 A fan(s), or alternate way of evenly distributing the gas, must be used while injecting methyl bromide into the enclosure.
- 8.3.3 Supply cylinders and the vaporiser must be inside the exclusion zone while methyl bromide is being injected into the enclosure.
- 8.3.4 The time methyl bromide injection is completed must be recorded on the record of fumigation.

8.4 Checking for leaks

- 8.4.1 During the injection of methyl bromide, the supply system must be checked for leaks. If a leak is detected the problem must be rectified before continuing to inject the dose.
- 8.4.2 The fumigation enclosure must be checked for leaks (unless the fumigation is being performed in a pressure tested enclosure). If leaks are detected, they must be rectified.

8.5 Even methyl bromide distribution

- 8.5.1 The methyl bromide must be evenly distributed throughout the enclosure. This is verified by equilibrium.
- 8.5.2 Equilibrium is achieved when the highest concentration reading is within 15% of the lowest concentration reading.

Note: Equilibrium result is expressed as a percentage and is equal to the highest concentration reading minus the lowest concentration reading, then divided by the lowest concentration reading, then multiplied by 100. The calculation for equilibrium is pictured:

$$\text{Equilibrium \%} = \frac{\text{Highest reading} - \text{Lowest reading}}{\text{Lowest reading}} \times 100$$

- 8.5.3 If the result of this calculation is more than 15%, equilibrium has not been achieved and additional time is needed to allow the methyl bromide to further distribute throughout the enclosure.

Note: Once equilibrium has been achieved it is not required at any other time.

8.6 Exposure period

8.6.1 The fumigation exposure period must not start until:

- all concentration readings are equal to or above the retention rate in the treatment schedule or, in the absence of specific retention information, the retention rates in Table 1, and
- equilibrium has been achieved in accordance with section 8.5. Even methyl bromide distribution.

Table 1 Time of concentration readings after methyl bromide injection and required retention rate of initial dose rate

Time after methyl bromide injection	Retention rate of initial dose rate concentration
15 to 30 minutes	85% or more
30 minutes to 1 hour	75% or more
More than 1 hour	70% or more

Notes: See Appendix 4: Methyl bromide monitoring tables for the retention rates for a range of initial dose rates at different time increments.

8.6.2 Retention rates and standard concentrations must be determined based on actual dose rate applied.

8.6.3 If additional methyl bromide needs to be added before start point has been reached, the amount must be calculated by subtracting the lowest concentration reading from the initial dose rate and multiplying that by the volume of the enclosure.

Additional dose (g) = Enclosure volume (m³) x (Initial dose rate – Lowest concentration reading)

8.6.4 If additional methyl bromide needs to be added before start point has been reached and the formulation contains less than 100% methyl bromide, the amount must be calculated in accordance with section 8.2.4.

8.6.5 If additional methyl bromide is added to the enclosure before the start of the exposure period, the time the injection of additional methyl bromide is completed becomes the new injection time for determining the required start time concentration.

8.6.6 The elapsed time between the start time and the end time of the fumigation must not be less than the exposure period prescribed in the treatment schedule.

8.6.7 After the specified exposure period has elapsed, final concentration readings must be taken from all monitoring locations. The readings and the time they are taken must be recorded on the record of fumigation.

- 8.6.8 At the end of the exposure period all concentration readings must be equal to or above the concentration in the treatment schedule or, in the absence of specific retention information, the standard concentrations in [Appendix 4: Methyl bromide monitoring tables](#).

9 Monitoring the fumigation

9.1 Gas concentration monitoring

- 9.1.1 Fans used to circulate methyl bromide must be turned off before taking gas concentration readings.
- 9.1.2 Gas concentration readings must be taken from all gas concentration monitoring locations at the start of the exposure period and at the end of the exposure period.
- 9.1.3 If the exposure period is longer than 24 hours, concentration readings must be taken from all concentration monitoring locations at least every 24 hours in addition to the start and end point readings.
- 9.1.4 All gas concentration readings must be recorded on the record of fumigation at the time they are taken. This includes readings taken prior to achieving start time or optional readings during the exposure period. Readings from additional concentration monitoring locations that are mandated by import conditions must also be recorded.
- 9.1.5 The time each set of concentration readings is taken must be recorded. If there is more than one reading in a set, the time the last reading is completed must be the time recorded.

Note: Additional readings can be taken at any time during the exposure period to check concentrations are equal to or above the levels required for an effective treatment.

9.2 Gas concentration monitoring – multiple sea containers in a sheeted stack

- 9.2.1 Section 9.2 applies if:
- the fumigation enclosure is a sheeted enclosure with multiple sea containers, and
 - the target of the fumigation is contained wholly inside the sea containers.
- 9.2.2 The fumigator may fail one single container in the sheeted enclosure, and pass the remainder of the sea containers in that enclosure, if:
- concentration readings fall below the standard in one single container, and,
 - the enclosure is not, or cannot be, topped up in compliance with the topping up requirements, and
 - all other concentration readings in all other containers are above the standard for all other concentration readings during the exposure period.

10 Topping-up methyl bromide levels

10.1 Topping-up during the exposure period

- 10.1.1 Additional methyl bromide may be added to the enclosure at any time during the exposure period if:
- a) all the concentration readings are equal to or above the standard concentration (Appendix 4: Table 3 Methyl bromide monitoring table, fumigation phase) and
 - b) the lowest concentration reading is below the maximum top-up concentration (Appendix 4: Table 3 Methyl bromide monitoring table, fumigation phase), and
 - c) the treatment schedule allows top-ups.
- 10.1.2 If a top-up is performed during the original exposure period, no extension of the exposure period is required.
- 10.1.3 Multiple top-ups are permitted during the exposure period.

10.2 Topping-up at the end of the exposure period

- 10.2.1 If the lowest concentration reading at the end of the exposure period is below the standard concentration but not below the minimum concentration to allow top-up (Appendix 4: Methyl bromide monitoring tables), additional methyl bromide may be added to the enclosure.
- 10.2.2 If a top-up is performed at the end of the exposure period, the fumigation must be extended for the minimum time specified in the treatment schedule. If no time extension is specified, the minimum time extension is four hours.
- 10.2.3 After the minimum four-hour extension time, readings must be taken from all sampling lines and the concentrations must be equal to or above the standard concentration required for the original exposure period, if not, the fumigation has failed.
- 10.2.4 Only one top-up at the end of the exposure period is permitted.
- 10.2.5 Topping-up the concentration at the end of the exposure period is not permitted if:
- a) the lowest concentration reading is below the minimum concentration to allow top-up (Appendix 4: Table 3 Methyl bromide monitoring table, fumigation phase); or
 - b) the treatment schedule prohibits topping-up.

10.3 Performing the top-up

- 10.3.1 The weight of methyl bromide for top-up must be calculated by subtracting the lowest concentration reading from the maximum to allow top-up concentration contained in Appendix 4: Methyl bromide monitoring tables, and multiplied by the volume of the enclosure.

Top-up amount (g) = Enclosure volume (m³) x (Maximum to allow top-up – Lowest concentration reading)

- 10.3.2 The top-up amount for formulations that contain less than 100% methyl bromide and round up must be performed in accordance with section 8.2 Calculating the dose.
- 10.3.3 The top-up amount must be injected into the fumigation enclosure in accordance with section 8.3 Injecting methyl bromide into the fumigation enclosure.
- 10.3.4 When the additional methyl bromide has circulated, a concentration reading must be taken from the monitoring location that had the lowest reading to verify that the methyl bromide is at or above the standard concentration.
- 10.3.5 Top-up details (amount, time and concentration readings) must be recorded on the record of fumigation.
- 10.3.6 If top-ups are performed equilibrium is not required.

11 Ventilating the fumigation enclosure

11.1 Threshold limit value (TLV)

- 11.1.1 The TLV is 5 parts per million (ppm) for methyl bromide unless a lower concentration is imposed by the relevant authorities in the jurisdiction where the fumigation takes place or the consignment destination.
- 11.1.2 The equipment used for measuring TLV must be able to measure the actual concentration, not just the presence of methyl bromide, to at least 1 ppm.
- 11.1.3 If stain tubes are used to detect methyl bromide, they must be used:
 - a) in accordance with the manufacturer's instructions; and
 - b) in conjunction with the sampling pump specified by the manufacturer; and
 - c) before the expiry date.

11.2 Releasing methyl bromide from the enclosure

- 11.2.1 At the end of the exposure period, the methyl bromide must be fully ventilated from the enclosure in a controlled and safe manner.
- 11.2.2 A risk assessment must be performed to manage the ventilation process and ensure it is safe by considering:
 - a) prevailing wind direction; and
 - b) location and proximity of unprotected personnel; and
 - c) extension of the exclusion zone (see section 5.1 Establish an exclusion zone) around the enclosure if required to prevent unprotected personnel in the vicinity from being exposed to methyl bromide levels above the TLV.

- 11.2.3 Personnel who are not wearing PPE (in accordance with section 2.3 Personal protective equipment (PPE)) are not permitted to enter the exclusion zone until the fumigator-in-charge verifies the concentration in the area and throughout the enclosure is at or below the TLV.
- 11.2.4 The enclosure must be ventilated until the concentration of methyl bromide within the enclosure remains at or below the TLV.
- 11.2.5 If the consignment is fumigated in the sea container(s) that will be used to transport the goods, each container must be checked individually to verify concentration at or below the TLV.
- 11.2.6 If the consignment is fumigated in an un-sheeted sea container, the sea container must not be moved until the methyl bromide concentration inside the enclosure is at or below the TLV.
- 11.2.7 If the consignment is a perishable commodity fumigation, packed in cartons and/or bags that have been opened during fumigation, the cartons and/or bags can only be closed once the methyl bromide concentration inside the cartons and/or bags is under the TLV.
- 11.2.8 The TLV readings and the time they are taken must be recorded on the record of fumigation.

11.3 Releasing the consignment from the control of the fumigator-in-charge

- 11.3.1 Following a fumigation, the consignment can only be released from the control of the fumigator-in-charge once the following requirements have been met:
 - a) the fumigation complies with the requirements of this methodology and the methyl bromide concentration has been verified at or below the TLV, or
 - b) the fumigation has failed, and it is subsequently unsuitable for further fumigation with methyl bromide and the methyl bromide concentration has been verified at or below the TLV.

12 Documentation

12.1 Retainment of fumigation documents

- 12.1.1 The treatment provider must keep a copy of all fumigation documentation for a minimum of two years.

12.2 Record of fumigation

- 12.2.1 A record of fumigation must be produced to demonstrate the fumigation complied with the requirements of this methodology.
- 12.2.2 The record of fumigation must be completed on the fumigation site as the tasks are performed.

- 12.2.3 The record of fumigation must be retained by the treatment provider for a minimum of two years.
- 12.2.4 False or misleading information must not be recorded on a record of fumigation.
- 12.2.5 At a minimum the record of fumigation must include:
- a) treatment provider identification
 - b) client name
 - c) start date and time of the fumigation
 - d) location – the site address where the fumigation is performed
 - e) a description of the consignment
 - f) the target of fumigation
 - g) consignment identification - container number(s), bill of lading, silo/shed number or other means to clearly identify the consignment
 - h) a declaration that the consignment complies with the treatment schedule, import conditions, and all requirements of the Methyl Bromide Fumigation Methodology
 - i) type of enclosure used
 - j) enclosure volume
 - k) the specified treatment schedule - dose rate, exposure period, and temperature
 - l) dose rate used – the dose rate used for the fumigation (if dose compensation for temperature variation is applied the temperature adjusted dose rate is recorded)
 - m) calculated dose – dose rate used multiplied by the enclosure volume, expressed as weight of methyl bromide
 - n) amount methyl bromide applied - the actual volume of methyl bromide injected into the enclosure, expressed as weight of methyl bromide
 - o) the time the methyl bromide injection into the enclosure is complete
 - p) the concentration readings from each concentration monitoring location and the time they are taken
 - q) result of the equilibrium calculation
 - r) serial number of the gas concentration monitoring device(s) used (minimum last 4 digits of the serial number)
 - s) the TLV readings and the time and date they are taken
 - t) the name and signature of the fumigator-in-charge
 - u) initial or signature of the fumigator at each concentration reading stage and TLV reading.
- 12.2.6 If the fumigation is an ambient temperature fumigation (section 6.1 Ambient temperature fumigations), the forecast minimum temperature must be recorded on the record of fumigation.

- 12.2.7 If the fumigation is a controlled temperature fumigation (section 6.2 Controlled temperature fumigations), the minimum temperature achieved within the enclosure must be recorded on the record of fumigation.
- 12.2.8 If the fumigation is a perishable commodity fumigation or if the temperature of the goods must be verified (section 6.3 Perishable commodity fumigation), the temperature of the goods must be recorded on the record of fumigation.
- 12.2.9 If the fumigation is a perishable commodity fumigation (section 6.3 Perishable commodity fumigation), the load factor and retention rate must be recorded on the record of fumigation.
- 12.2.10 If additional fumigant is added to the fumigation (in accordance with section 10 Topping up the methyl bromide levels), the top-up amount, time and concentration must be recorded on the record of fumigation.
- 12.2.11 If additional fumigant is added (in accordance with section 8.6 Exposure period), the additional amount and time injected must be recorded on the record of fumigation.

Note: An example record of treatment is provided at Appendix 1: Example record of fumigation and Appendix 2: Example record of fumigation perishable commodity.

12.3 Fumigation treatment certificate

- 12.3.1 A fumigation treatment certificate is issued once the fumigator-in-charge determines the fumigation has complied with requirements of this methodology.
- 12.3.2 False or misleading information must not be recorded on a fumigation treatment certificate.
- 12.3.3 At a minimum the fumigation treatment certificate must include:
 - a) treatment provider's letterhead including name and physical address
 - b) treatment provider's identification (AEI if an AEI is required by the treatment scheme or import conditions)
 - c) certificate number
 - d) name of fumigant
 - e) target of fumigation
 - f) description
 - g) quantity
 - h) consignment link (such as container number, bill of lading, invoice number)
 - i) country or origin
 - j) port of loading
 - k) country of destination
 - l) date and time fumigation commenced
 - m) date and time fumigation completed

- n) place of fumigation (site registration number if applicable)
- o) type of enclosure used
- p) treatment schedule [prescribed dose rate/ specified dose rate (g/m^3)]
- q) exposure period (hours)
- r) forecast minimum temperature ($^{\circ}\text{C}$) or minimum temperature achieved in the enclosure or commodity core temperature.
- s) applied dose rate (g/m^3)
- t) final TLV reading (ppm)
- u) a declaration that the consignment complies with the treatment schedule, import conditions, and all requirements of the Methyl Bromide Fumigation Methodology
- v) the signature of the fumigator-in-charge and date of signing
- w) date the certificate is endorsed and issued.

Note: An example fumigation treatment certificate is provided at [Appendix 3: Example fumigation treatment certificate](#)

- 12.3.4 The treatment provider must make all fumigation documentation available on request, by the relevant authorities, for audit and registration purposes.
- 12.3.5 The fumigation treatment certificate must be clearly linked to the consignment.

Appendix 1: Example record of fumigation

(Insert your business logo or letterhead)

(Including address as it appears on the treatment provider file)

Record of fumigation – Methyl bromide fumigation (non-perishable commodity)									
Section A: Fumigator in charge									
Full Name					Accreditation number (if applicable)				
Section B: Job details									
Treatment provider ID						Client name/details			
Job identification number									
Location of fumigation					Description of consignment				
Street address									
Suburb/town/city					Target of fumigation				
Country					Postcode				
Consignment identification/Container numbers									
Section C: Fumigation details									
Specified treatment schedule					Enclosure type (select one)				
Dose rate (g/m ³)		Exposure period (hrs)			<input type="checkbox"/> Sheeted enclosure <input type="checkbox"/> Fumigation chamber <input type="checkbox"/> Un-sheeted container(s) <input type="checkbox"/> Other _____				
Consignment suitability (Section 3 of the methodology)					Enclosure volume				
Was the consignment suitable for fumigation?					Length		Height		Width (m)
<input type="checkbox"/> Yes – consignment suitable <input type="checkbox"/> No – remedial action taken If no, what action?					Total volume		Total volume (m ³)		
Fumigation type (select one)					Dose rate used		Dose rate (g/m ³)		
<input type="checkbox"/> Ambient temperature: Forecast min temp °C/°F <input type="checkbox"/> Controlled temperature: Min enclosure temp °C/°F					Calculated dose		Calculated dose (g)		
Heaters used? <input type="checkbox"/> Yes <input type="checkbox"/> No					Amount CH ₃ Br applied		Amount (g)		
Section D: Concentration readings Monitoring readings by locations – Each reading must be initiated by the fumigator(s) who took the reading									
Serial number of monitoring device(s)									
1	2	3	4	5	Equilibrium result (ppm)	Standard (g/m ³)	Dose (g/m ³)	Time (hh:mm)	Fumigator's initials
Time and date: Fumigant injection finished									
Start					1/2				
					3/4				
During									
End									
Time and date: Enclosure ventilation start									
Final TLV readings (all)					ppm	ppm	ppm		
Top-up details									
Amount (g/m ³)			Time (hh:mm)			Concentration (g/m ³)			
Section E: Fumigator declaration – To be completed by the fumigator in charge named in Section A of this record									
I, the fumigator in charge declare that the fumigation was conducted in accordance with the treatment schedule and all the requirements in the Methyl Bromide Fumigation Methodology, and the information I have provided is true and correct.									
Signature					Date (dd/mm/yyyy)				
Government officer if supervised			Name			Signature			

Appendix 2: Example record of fumigation perishable commodity

{insert your business logo or letterhead}
{including address, as it appears on the treatment provider form}

Record of treatment – Methyl bromide fumigation (perishable commodity)										
Section A: Fumigator in charge										
Full Name						Accreditation number (if applicable)				
Section B: Job details										
Treatment provider ID				Client name/details						
Job identification number										
Location of fumigation				Description of consignment						
Street address				Target of fumigation						
Suburb/town/city										
Country Postcode										
Consignment identification/Container numbers										
Section C: Fumigation details										
Consignment suitability (section 3 of the methodology)						Enclosure volume (m ³)				
Was the consignment suitable for fumigation?						Length	Height	Width (m)		
<input checked="" type="checkbox"/> Yes – consignment suitable <input type="checkbox"/> No – remedial action taken If no, what action?						Total volume		(m ³)		
						Dose				
Specified treatment schedule						Dose rate used		(g/m ³)		
Dose rate (g/m ³)		Exposure period (hrs)		Calculated dose		(g)				
Temperature (°C)				Chloroform <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: %				
Retention rate (%)		or CT product		Amount CH3Br applied		(g)				
Temperature probe location						Load factor				
<input type="checkbox"/> Inside packaging <input type="checkbox"/> Inserted into pulp						Maximum %		Estimated %		
Section D: Concentration and temperature readings										
Temperature readings (°C) Each reading must be signed by the fumigator(s) who took the reading										
1	2	3	4	5	6	7	Date (dd/mm)	Temp (h/room)	Fumigator(s) signature	
									am/pm	
									am/pm	
									am/pm	
									am/pm	
Monitoring readings by locations Each reading must be signed by the fumigator(s) who took the reading										
Serial number of monitoring device(s)										
	1	2	3	4	5	Equilibrium result (%)	Standard (g/m ³)	On/Off (s/d/room)	Time (h/min)	Fumigator(s) signature
Time and date: fumigant injection finished									am/pm	
Start						3%			am/pm	
						3%			am/pm	
During						3%			am/pm	
						3%			am/pm	
						3%			am/pm	
End						3%			am/pm	
Final T/V readings (all)						ppm	ppm		am/pm	
Section E: Fumigator declaration - To be completed by the fumigator in charge named in Section A of this record										
I, the fumigator-in-charge declare that the fumigation was conducted in accordance with the treatment schedule and all the requirements in the Methyl Bromide Fumigation Methodology, and the information I have provided is true and correct.										
Signature						Date (dd/mm/yyyy)				
Government officer if supervised				Name			Signature			

Appendix 3: Example fumigation treatment certificate

[Insert your business logo or letterhead]

(Including address as it appears on the treatment provider list)

Date issued (dd/mm/yyyy) _____

Treatment certificate – Methyl bromide fumigation

Certificate number		Treatment provider ID number	
Consignment details			
Consignment link (container numbers if applicable)			
Seal number(s) (if applicable)			
Client name			
Client Address			
Commodity description			
Commodity country of origin		Commodity quantity	
Port of loading		Destination country	
Target of fumigation (pick all that apply)		Enclosure type (pick one)	
<input type="checkbox"/> Commodity	<input type="checkbox"/> Container	<input type="checkbox"/> Packaging	<input type="checkbox"/> Sheeted enclosure <input type="checkbox"/> Fumigation chamber <input type="checkbox"/> Un-sheeted enclosure
<input type="checkbox"/> Other (provide details) _____		<input type="checkbox"/> Other (provide details) _____	
Treatment schedule (prescribed/specified treatment schedule)			
Dose rate: _____ (g/m ³)	Exposure period: _____ (hours)	Temperature: _____ (°C)	
Fumigation details (treatment applied)			
Applied dose: _____ (g/m ³)	Exposure period: _____ (hours)	Temperature: _____ (°C)	
Place of fumigation (Full address)		Street address	
		Suburb/town/city	
		Country	Postcode
Date and time fumigation commenced (dd/mm/yyyy – HH:MM)		am/pm	
Date and time fumigation completed (dd/mm/yyyy – HH:MM)		am/pm	
Final TSV reading (ppm)		ppm	
Declaration			
I, the fumigator in charge declare:			
1. The fumigation certified was conducted in accordance with the treatment schedule, import conditions, and all the requirements in the Methyl Bromide Fumigation Methodology, and			
2. The information I have provided is true and correct.			
Signature (sign your name)			
Full name			
Date (dd/mm/yyyy)		Accreditation number	
Additional Declarations			

Appendix 4: Methyl bromide monitoring tables

Table 2 Methyl bromide monitoring table, gas distribution phase

Category	Timing	Dose ^a	Standard concentration (g/m ³)									
Initial dose	0 hours	100%	32	40	48	56	64	72	80	88	96	128
Start point	¼ to ½ hour	85% or more	27.2	34	40.8	47.6	54.4	61.2	68	74.8	81.6	108.8
	½ to 1 hour	75% or more	24	30	36	42	48	54	60	66	72	96
	More than 1 hour	70% or more	22.4	28	33.6	39.2	44.8	50.4	56	61.6	67.2	89.6

^a % of initial dose

Notes: Dosing is complete once the required amount of gas has been applied to the enclosure. Start Point is achieved when all concentration readings are at or above the standard. Maximum top-up concentration is 100% of initial dose.

Table 3 Methyl bromide monitoring table, fumigation phase

Timing	Dose ^a	Concentration (category)	Concentration (g/m ³)									
0 hours: initial dose	100%	Standard	32.0	40.0	48.0	56.0	64.0	72.0	80.0	88.0	96.0	128.0
2 hours	60% or more	Standard	19.2	24.0	28.8	33.6	38.4	43.2	48.0	52.8	57.6	76.8
		Minimum to allow top-up	14.2	19.0	23.8	28.6	33.4	38.2	43.0	47.8	52.6	68.8
		Maximum top-up	24.2	29.0	33.8	38.6	43.4	48.2	53.0	57.8	62.6	84.8
4 hours	50% or more	Standard	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	64.0
		Minimum to allow top-up	11.0	15.0	19.0	23.0	27.0	31.0	35.0	39.0	43.0	56.0
		Maximum top-up	21.0	25.0	29.0	33.0	37.0	41.0	45.0	49.0	53.0	72.0
12 hours	35% or more	Standard	11.2	14.0	16.8	19.6	22.4	25.2	28.0	30.8	33.6	44.8
		Minimum to allow top-up	6.2	9.0	11.8	14.6	17.4	20.2	23.0	25.8	28.6	36.8
		Maximum top-up	16.2	19.0	21.8	24.6	27.4	30.2	33.0	35.8	38.6	52.8

Timing	Dose ^a	Concentration (g/m ³)														
24 hours	30% or more	Standard	9.6	12	14.4	16.8	19.2	21.6	24	26.4	28.8	31.2	33.6	36.0	38.4	40.8
		Minimum to allow top-up	4.6	7.0	9.4	11.8	14.2	16.6	19.0	21.4	23.8	26.2	28.6	31.0	33.4	35.8
		Maximum top-up	14.6	17	19.4	21.8	24.2	26.6	29.0	31.4	33.8	36.2	38.6	41.0	43.4	45.8
48 hours	25% or more	Standard	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0
		Minimum to allow top-up	3.0	5.0	7.0	9.0	11.0	13.0	15.0	17.0	19.0	21.0	23.0	25.0	27.0	29.0
		Maximum top-up	13.0	15.1	17.0	19.0	21.0	23.0	25.0	27.0	29.0	31.0	33.0	35.0	37.0	39.0

^a % of initial dose

Notes: Dosing is complete once all the required amount of gas has been applied to the enclosure. Start point is achieved when all concentration readings are at or above the standard. The duration of the fumigation is measured from when the start point is achieved. For example, if a 24-hour fumigation reaches start point 1½ hours after dosing, the fumigation is completed 25½ hours after applying the dose and all concentrations are at or above the standard specified for 24 hours.

Table 4 Methyl bromide minimum standard concentrations

Timing (hours)	Retention (%)	Minimum standard concentration required (g/m ³) ^a														
0 ^b	100.00	32	48	56	64	72	80	88	96	104	112	120	128	136	144	152
%	75.00	24.00	36.00	42.00	48.00	54.00	60.00	66.00	72.00	78.00	84.00	90.00	96.00	102.00	108.00	114.00
1	70.00	22.40	33.60	39.20	44.80	50.40	56.00	61.60	67.20	72.80	78.40	84.00	89.60	95.20	100.80	106.40
2	60.00	19.20	28.80	33.60	38.40	43.20	48.00	52.80	57.60	62.40	67.20	72.00	76.80	81.60	86.40	91.20
3	54.80	17.54	26.30	30.69	35.07	39.46	43.84	48.22	52.61	56.99	61.37	65.75	70.14	74.53	78.91	83.30
4	50.00	16.00	24.00	28.00	32.00	36.00	40.00	44.00	48.00	52.00	56.00	60.00	64.00	68.00	72.00	76.00
5	47.80	15.30	22.94	26.77	30.59	34.42	38.24	42.06	45.89	49.71	53.54	57.37	61.18	65.01	68.83	72.66
6	45.70	14.62	21.94	25.59	29.25	32.90	36.56	40.22	43.87	47.53	51.18	54.83	58.48	62.13	65.78	69.43
7	43.70	13.98	20.98	24.47	27.97	31.46	34.96	38.46	41.95	45.45	48.94	52.43	55.93	59.43	62.93	66.42
8	41.80	13.38	20.06	23.41	26.75	30.10	33.44	36.78	40.13	43.47	46.82	50.16	53.50	56.85	60.19	63.54
9	40.00	12.80	19.20	22.40	25.60	28.80	32.00	35.20	38.40	41.60	44.80	48.00	51.20	54.40	57.60	60.80
10	38.30	12.26	18.38	21.45	24.51	27.58	30.64	33.70	36.77	39.83	42.90	45.96	49.02	52.09	55.15	58.22

Timing (hours)	Retention (%)		Minimum standard concentration required (g/m ³) ^a													
11	36.60	11.71	17.57	20.50	23.42	26.35	29.28	32.21	35.14	38.06	40.98	43.90	46.83	49.75	52.67	55.59
12	35.00	11.20	16.80	19.60	22.40	25.20	28.00	30.80	33.60	36.40	39.20	42.00	44.80	47.60	50.40	53.20
16	33.35	10.67	16.01	18.68	21.34	24.01	26.68	29.35	32.02	34.68	37.35	40.02	42.69	45.36	48.02	50.69
20	31.65	10.13	15.19	17.72	20.26	22.79	25.32	27.85	30.38	32.92	35.45	37.98	40.51	43.04	45.58	48.11
24	30.00	9.60	14.40	16.80	19.20	21.60	24.00	26.40	28.80	31.20	33.60	36.00	38.40	40.80	43.20	45.60
28	29.15	9.33	13.99	16.32	18.66	20.99	23.32	25.65	27.98	30.32	32.65	34.98	37.31	39.64	41.98	44.31
32	28.31	9.06	13.59	15.85	18.12	20.38	22.65	24.91	27.18	29.44	31.71	33.98	36.24	38.50	40.77	43.03
36	27.47	8.79	13.19	15.38	17.58	19.78	21.98	24.17	26.37	28.57	30.76	32.95	35.14	37.33	39.52	41.71
40	26.64	8.52	12.79	14.92	17.05	19.18	21.31	23.44	25.57	27.71	29.84	31.97	34.10	36.23	38.36	40.49
44	25.82	8.26	12.39	14.46	16.52	18.59	20.66	22.72	24.79	26.85	28.92	30.99	33.05	35.12	37.18	39.25
48	25.00	8.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00

^a If the concentration measuring instrument used can only read in whole grams then the minimum standard concentration must be rounded up to the nearest whole number. ^b Initial dose. Notes: Minimum concentration to allow top-up is 5 g/m³ below the standard concentration for initial doses of 32 to 56 g/m³. Minimum concentration to allow top-up is 8 g/m³ below the standard concentration for initial doses of 64 to 152 g/m³. Maximum top-up concentration is 5 g/m³ above the standard concentration for initial doses of 32 to 56 g/m³. Maximum top-up concentration is 8 g/m³ above the standard concentration for initial doses of 64 to 152 g/m³. Concentration readings must be equal to or above the required concentrations specified for the hour preceding the reading – for example, a reading taken at 24 hours must be equal to or above the concentrations specified at 24 hours.

Table 5 Methyl bromide minimum concentrations for fumigations that require 80% retention

Concentration	Minimum standard concentration required (g/m ³) ^a													
Starting	32	48	56	64	72	80	88	96	104	128	136	144	152	
Minimum	25.6	38.4	44.8	51.2	57.6	64.0	70.4	76.8	83.2	102.4	108.8	115.2	121.6	

^a If the instrument used only reads in whole grams, the standard concentration must be rounded up to the nearest whole number.

Table 6 Methyl bromide monitoring ready reckoner

Dose g/m ³	Gas Distribution Phase										Dosing is complete once ALL the required amount of gas has been applied to the enclosure
	Initial Dose	32 g/m ³	40 g/m ³	48 g/m ³	56 g/m ³	64 g/m ³	72 g/m ³	80 g/m ³	88 g/m ³	120 g/m ³	
Start Point	16 - 18 hr 80% or more of initial dose	32	40	48	56	64	72	80	88	120	Start Point is achieved when ALL concentration readings are at or above the Standard
	14 - 16 hr 75% or more of initial dose	27.2	34	40.8	47.6	54.4	61.2	68	74.8	108.8	
	12 - 14 hr 70% or more of initial dose	24	30	36	42	48	54	60	66	96	
Fumigation Phase	2 hrs 80% or more of initial dose	19.2	24	28.8	33.6	38.4	43.2	48	52.8	76.8	The duration of the fumigation is measured from when the Start Point is achieved. For example, if a 24 hr fumigation reaches Start Point 1 1/2 hrs after dosing, the fumigation is completed 25 1/2 hrs after applying the dose and ALL concentrations are at or above the standard specified for 24 hrs.
	4 hrs 50% or more of initial dose	16	20	24	28	32	36	40	44	64	
	12 hrs 35% or more of initial dose	11.2	14	16.8	19.6	22.4	25.2	28	30.8	44.8	
Methyl Bromide Concentration After Start Point	24 hrs 30% or more of initial dose	9.6	12	14.4	16.8	19.2	21.6	24	26.4	38.4	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> A B C </div> A = Standard Concentration B = Minimum concentration to allow top-up C = Maximum top-up concentration
	48 hrs 25% or more of initial dose	8	10	12	14	16	18	20	22	32	



Glossary

Term	Definition
Ambient temperature	The air temperature of the surrounding area where the fumigation will be performed.
Ambient temperature fumigation	When the enclosure being fumigated is subject to environmental ambient temperatures or outdoors.
Carton	Box, often cardboard or polystyrene, in which perishable commodities are packed for transport and sale.
Chloropicrin	A strong-smelling chemical commonly added to the odourless methyl bromide to indicate the presence of gas.
Commodity	The item or goods that are being exported or imported.
Concentration	The amount of methyl bromide present at a certain point in the fumigation enclosure, usually expressed as grams per cubic metre (g/m ³).
Concentration sampling tube	A small diameter tube used to draw a sample of gas/air mixture from within a fumigation enclosure to measure the methyl bromide concentration.
Consignment	Refers collectively to the commodity, any packing materials used and the mode of transport such as sea container.
Controlled temperature fumigation	When an artificial heat source is used to heat and maintain the temperature of an enclosure during a fumigation.
Dose	The amount of methyl bromide injected to a fumigation enclosure.
Dose rate	The prescribed concentration of methyl bromide to be used per unit of volume and the exposure period (temperature adjusted if applicable).
Enclosure	Any gas-tight space intended to contain sufficient concentrations of methyl bromide for a period of time. Common examples of fumigation enclosures used for QPS fumigations are (but not limited to) un-sheeted sea containers, semi-permanent or permanent structures, sheeted enclosures, vessel holds, silos and bunkers.
Equilibrium	An even distribution of methyl bromide throughout the enclosure.
Exclusion zone	The area around the enclosure to which access is restricted to personnel wearing personal protective equipment.
Exposure period	The amount of time, in one continuous block, that the consignment must be exposed to sufficient concentration levels of methyl bromide to be lethal to the targeted pests.
Fil for purpose	Equipment that is suitable and appropriate for its intended use. That is, capable of measuring methyl bromide or temperature specifically and in the concentration or temperature ranges necessary to meet the requirements of this methodology.
Fumigant	A chemical, which at a particular temperature and pressure can exist in a gaseous state in sufficient concentration and for sufficient time to be lethal to insects and other pests.
Fumigation chamber	A gas-tight fumigation enclosure with an inbuilt extraction system. All requirements for fumigation chambers specified in section 3.3 Fumigation chambers.
Fumigation documentation	Documents and records associated with particular fumigations that is not a record of fumigation. May be hardcopy or softcopy.
Fumigation sheets	A sheet (or tarpaulin) used to create a sheeted enclosure that is made of material impermeable to methyl bromide.
Fumigator	An individual responsible for conducting fumigation activities under the supervision of the fumigator-in-charge.
Fumigator-in-charge	The licenced and/or accredited individual that is responsible for the conduct of the fumigation at the time specific fumigation activities are undertaken.
Gas concentration	The specified location where gas must be drawn from for the purpose of determining the gas concentration at that location. This is location where concentration sampling tubes or

Term	Definition
monitoring location	gas concentration sampling equipment is placed.
Goods	Goods includes an animal, a plant, a sample or specimen, a pest, tool or any other article, substance or thing (including, but not limited to, any kind of moveable property).
Good working order	State of an item, system or equipment is deemed to be functioning properly, without significant defects or impairments that hinder its intended operations or performance.
Impermeable package and wrappings	Intact and solid plastic films and wrappings that prevent or impede gas exchange.
Load factor	Specifies the maximum volume of space that the commodity can occupy in the enclosure to achieve rapid fumigation circulation. Normally expressed as a percentage (for example, maximum load factor of 50%).
Manufacturer's instructions	Specific details on equipment produced by the equipment manufacturer. May include instruction manuals, operating instructions, conditions of use or calibration information.
Maximum top-up concentration	The concentration used to calculate the amount of methyl bromide to be added to the enclosure when topping-up.
Minimum top-up concentration	The absolute minimum concentration below which levels methyl bromide concentration must not be below to allow top-up at the end of the exposure period.
Pascal (Pa)	The standard international unit for pressure. Standard atmospheric pressure is 101.325 kPa.
Perishable commodities	Commodities such as, cut flowers, fresh fruit, fresh vegetables, fresh leaves, fresh herbs, fresh fungi and nursery stock that will deteriorate rapidly if not stored or transported under suitable conditions.
Pest	Any animal, plant or other organism that may pose a threat to the community or the natural environment.
Quarantine pest	A pest of potential economic and/or environmental importance to an area where it is not yet present or is present but not widely distributed and is being officially controlled.
Quarantine and Pre-shipment (QPS)	<p>1) 'Quarantine applications', with respect to methyl bromide, are treatments to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where:</p> <ul style="list-style-type: none"> a) Official control is that performed by, or authorised by, a national plant, animal or environmental protection or health authority. b) Quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. <p>2) 'Pre-shipment applications' are those non-quarantine applications applied within 21 days prior to export to meet the official requirements of the importing country or existing official requirements of the exporting country.</p> <p>This definition is based on the Montreal Protocol on Substances that Deplete the Ozone Layer. Non-QPS uses of methyl bromide is prohibited under the Montreal Protocol unless a specific exemption is approved by Parties to the Montreal Protocol.</p>
Record of fumigation	An official document or electronic record that records the information of section 12 to demonstrate the fumigation complied with requirements.
Relevant authority	The government department, ministry or agency responsible for animal and plant biosecurity in the importing or exporting jurisdiction.
Risk Assessment	An assessment performed and recorded according to any instructions on the product label, safety data sheet or jurisdictional licence requirements. In the absence of this, a visual inspection to meet the requirements of this methodology that the fumigator-in-charge can verbally describe.
Sheeted enclosure	An enclosure created under a gas-proof sheet that is covering/enclosing the commodities to be fumigated.
Sheeted stack	Any sheeted enclosure over free standing goods.
Sea container	Standardised transportation units that can be moved from one mode of transport to another without needing to unload the contents.

Term	Definition
Standard concentration	The methyl bromide concentration below which the fumigation will not be effective unless additional fumigation is added to the enclosure to compensate.
Target of fumigation	The specific object or area that is intended to be treated through the fumigation process. The target of fumigation may be the commodity, packaging material, container, or conveyance or combination of these.
Threshold limit value (TLV)	TLV is the maximum concentration of methyl bromide that a person can be repeatedly exposed to in the workplace without harmful effects. This figure is based on an 8-hour day, 40-hour working week.
Treatment	Application of a set of specified requirements intended to kill pests and diseases that may be associated with a consignment.
Timber	Processed wood harvested from trees, often processed into beams and planks.
Timber products	Any product made from timber or wood.
Treatment provider	An entity or company that is responsible for the effective conduct of a QPS treatment.
Treatment schedule	Specific treatment rates, exposure period and rules as imposed by the relevant authority – usually the importing jurisdiction.
Treatment temperature	The temperature at which the applied dose rate is calculated.
Vacuum chamber	A rigid enclosure from which air and other gases are removed by a vacuum pump. This results in a low-pressure environment within the chamber.
Verifiable weather source	Reliable source of weather data that can be independently confirmed and validated at audit.



Ministry of Agriculture, Forestry and Fisheries
Department of International Agriculture
Policy and Affairs

Agriculture International Representation Post locations



MC Agriculture Minister Counselor AC Agriculture Counselor AFS Agriculture First Secretary

The Americas

Europe

North Asia

South Asia/Oceanic Islands



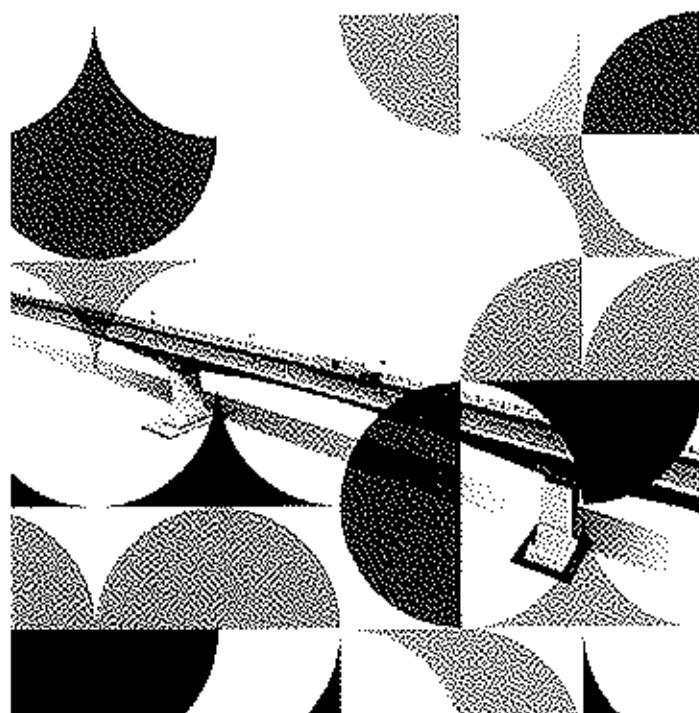
Using Good regulatory practices to improve SPS measures: A win-win for safe trade facilitation

Quarantine Regulators Meeting (QRM)
28 April – 2 May 2025, Manila, The Philippines

Catalina PULIDO
STDF Secretariat

[FIND OUT MORE](#)

[Download the STDF Quarantine Regulators Meeting 2025](#)



WTO SPS Agreement

Recognizing the right to
protect human, animal
and/or plant life and health



Obligation to avoid
unnecessary barriers to
trade



**World Organisation
for Animal Health**
Founded as OIE

**International Plant
Protection Convention**

[Download the STDF Quarantine Regulators Meeting 2025](#)

What is the Standards and Trade Development Facility (STDF)?

A Global partnership that helps developing countries improve their food safety, and animal and plant health capacity to meet **SPS requirements** -based on international standards- to gain or maintain market access.



Food and Agriculture
Organization of the
United Nations



WORLD BANK GROUP



World Health
Organization



World Organisation
for Animal Health
Founded as OIE



WORLD TRADE
ORGANIZATION

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What does the STDF do?

Three Workstreams:

1. Global platform for coordination and dialogue

+

2. Knowledge work to identify and disseminate good practices

+

3. Funding mechanism to develop and implement innovative, collaborative projects based on international standards



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What is driving the use of GRPs?

- Opportunity to reduce trade costs
- Emerging and existing SPS issues
- Bilateral and regional trade agreements
- Digitalization and the move towards e-SPS certification
- Regulatory cooperation on SPS measures at international and regional level
- One Health approach



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Why use GRPs?

- Better designed SPS measures based on international standards
- Improved understanding and compliance with SPS measures
- Reduced cost and administrative burden of SPS measures
- Increased trust of the private sector and consumers in regulatory processes
- Enhanced confidence of trading partners and investors



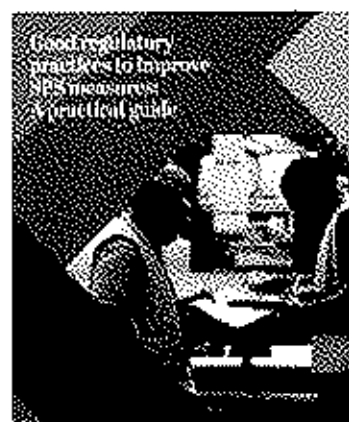
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STDF GRP Guide

- **Aim:** Good practices and guidance to increase the effectiveness of SPS regulatory interventions
- **Audience:** SPS authorities involved in the development, implementation and/or review of SPS measures in developing countries, and other relevant stakeholders
- Link to GRP tools and resources developed by STDF partners and other stakeholders

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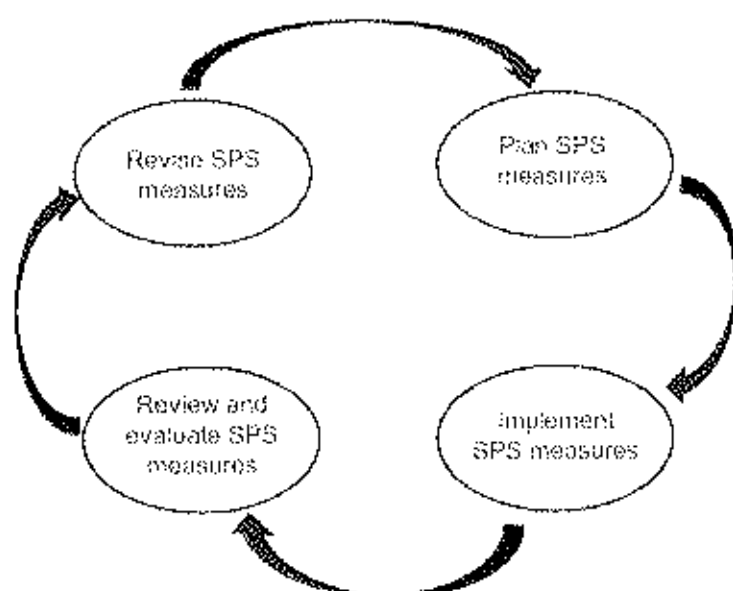
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Spa.Mgr: www.stdf.int/why-us/why-us/en/what-is-the-grp-guide-EN.pdf

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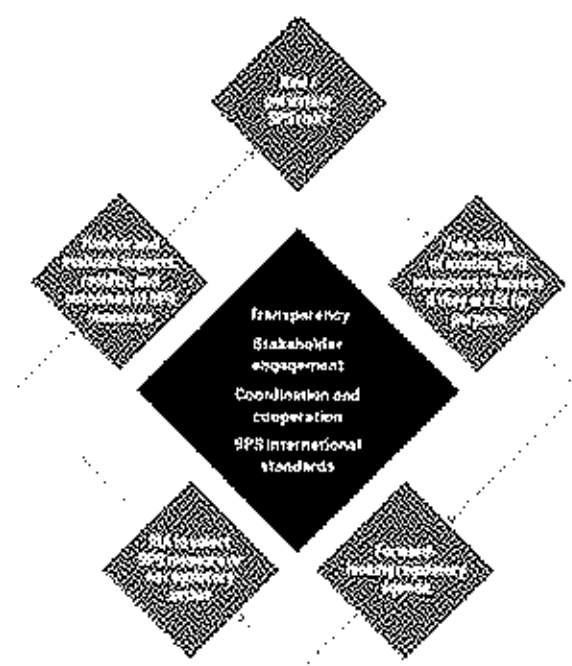
GRPs support SPS measures that are fit-for-purpose



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What are GRPs?



Source: European Commission (2015)

STOP | CHAPTER 1

Key principle # 1: Transparency

A multi-faceted and cross-cutting GRP

- Sharing/disseminating information; increased use of online tools
- Engaging stakeholders
- Considering inputs
- Cooperation and coordination at across international, regional, national levels
- Key element of RIA, stocktaking, monitoring and evaluation

A key WTO principle



Notification of draft SPS measures

- Allow for comments from trading partners

Publication of SPS requirements

- Leave time for traders to adjust to SPS requirements

Enquiry points + National notification authority

- Notify SPS documents and respond to enquiries from trading partners
- Track SPS documents and alert stakeholders of important changes
- Coordinate/submit comments on notifications
- Follow-up on comments received

Source: European Commission (2015)

STOP | CHAPTER 1

Lao PDR Trade portal:

Increased transparency of trade-related regulatory information

Provides easy access to:

- All laws, regulations and other legal instruments
- License and permit requirements, prohibitions, restrictions, technical standards, SPS measures
- Procedures for license/permit applications and clearance
- Relevant forms
- Contacts of SPS agencies, SPS Enquiry Points, etc.



Source: <http://www.lao-pdr.gov.la>

STDF/2007/039

Key principle # 2: Engaging stakeholders

Why it matters?

- Assess needs and challenges of operators and regulators
- Identify unintended impacts
- Consider diverse perspectives and foster inclusive SPS regulations: MSMEs, lower income farmers, women etc.
- Foster better understanding of SPS measures
- Garner support of stakeholders
- Build confidence



Tailored SPS measures and increased compliance

Source: <http://www.lao-pdr.gov.la>

STDF/2007/039

Public consultations in Thailand

Protocol includes:

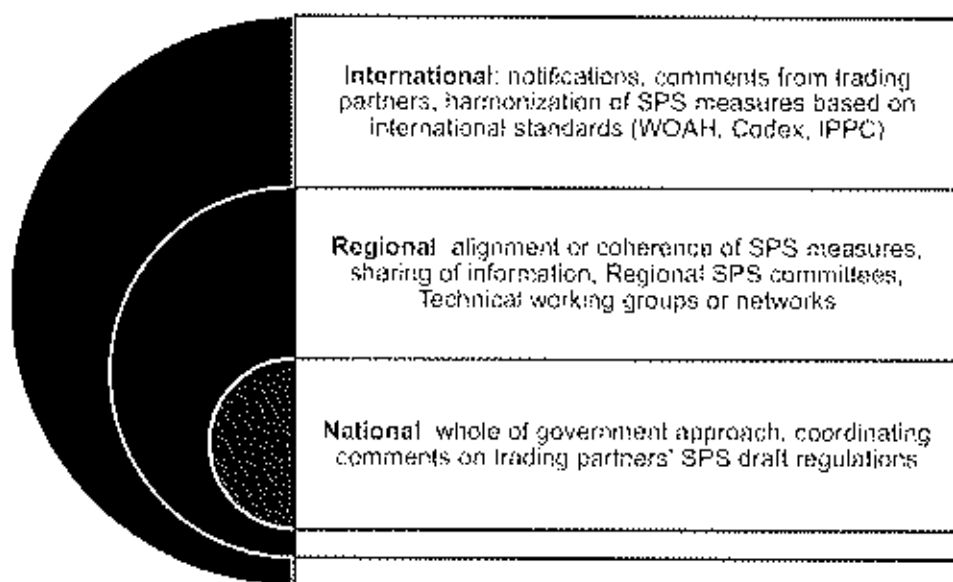
- Regulating agency solicit inputs on draft regulations via stakeholder consultation website (minimum 15-day consultation period)
- Sharing substantive information on the draft regulation and rationale online.
- Reporting on feedback received may be considered when regulation is up for approval



Source: Thailand, 2019

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Key principle # 3: Coordination and cooperation



World Organisation
for Animal Health
FAO member

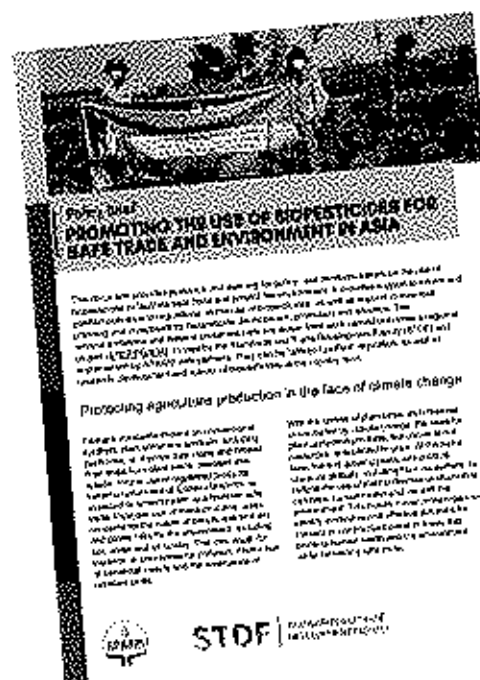


C O D E X
ALIMENTARIUS
International Food Standards
Association

Source: FAO, 2019

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Mitigating pesticide residue through promotion of biopesticides in Asia



Bangladesh, Lao PDR, Malaysia, Nepal, Philippines, Sri Lanka, Thailand, Viet Nam

- **Regional Policy Brief** on biopesticide regulation aligned with ASEAN guidelines to support regulatory harmonization
- National regulation updated in Bangladesh; technical working groups formed
- **Regional workshop** (Bangkok) with 54 participants on regulatory harmonization.
- Conducted 18 residue mitigation studies, reducing pesticide MRL values by 50%, and developed protocols for key crops.
- 40+ lab technicians trained in GLP; training at SFA (Singapore)
- Capacity building and training in MRL data generation and biopesticide production.
- Farmer engagement.

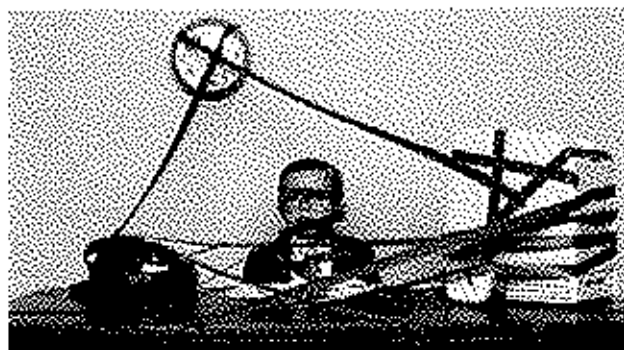
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See More: www.stdf.int/briefs.asp?PG=634

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Key principle # 4: Regulatory stocktaking

Are existing SPS measures fit for purpose?



Regular Stocktaking Explained:

What is it?

- Provides inventory of regulations and agencies
- Encourages dialogue with stakeholders
- Conducts assessment of necessity, relevance, effectiveness of regulatory requirements

Why does it matter?

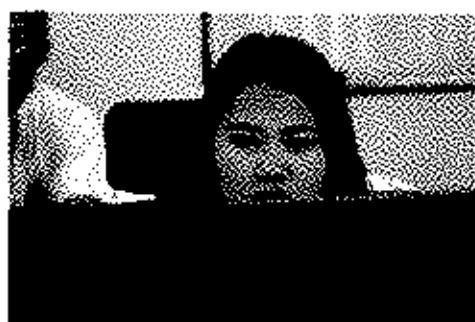
- Identifies outdated/ineffective SPS measures
- Ensures SPS measures are consistent with international standards, WTO SPS Agreement.
- Modernizes and simplify SPS regulations
- Gets rid of overlaps/gaps in SPS requirements

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Regulatory Information System in the Republic of Korea

- Central online system to support a whole-of-government approach to regulatory management and reform
- Covers the process of regulatory review (from initial request by ministry to preparation of review report)
- Means to identify unregistered regulations and termination dates of sunset laws
- Improves the monitoring of regulatory reform processes led by different ministries

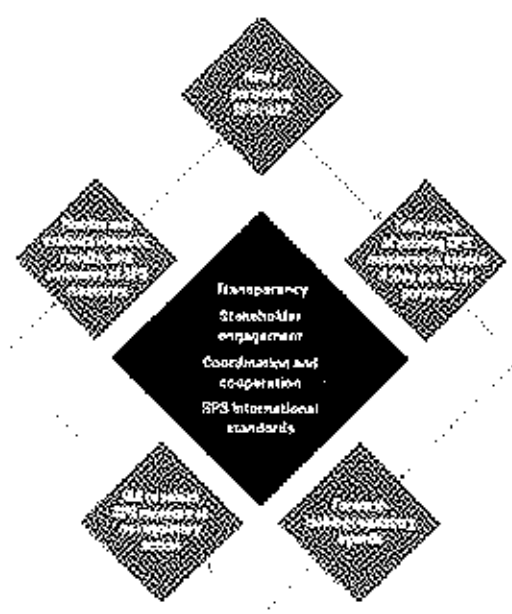


2. Regulatory Information System

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Other key principles in GRPs (continued)

- **Forward-looking regulatory agenda:** To understand and increase awareness about upcoming legal and regulatory initiatives
- **Regulatory Impact Assessment:** To assess positive and negative effects of (existing or proposed) regulations, and non-regulatory alternatives
- **Monitoring and evaluation:** To review and assess the performance of existing SPS measures



2. Regulatory Information System

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Putting GRPs into practice in The Philippines – STDF project grant

- **Strengthen Regulatory Impact Assessment (RIA) Implementation:** pilot in two meat regulations.
- **Capacity Building:** enhance the knowledge and skills of regulatory and policy personnel.
- **Policy and Regulatory Improvements:** gather lessons learned to update and improve the existing RIA policy instrument for the agriculture and fisheries sectors.
- **Establish a Good Regulatory Practices (GRP) Network:** facilitate the sharing of good practices and experiences among regulatory agencies with private sector participation.



Led by the Office of the Assistant Secretary for Policy and Regulations (OASPR), Department of Agriculture.

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For more information, contact: stfdf@stfdf.net

See more: <https://www.stfdf.net/en/our-grps/>

ADB–WTO–Pakistan Virtual Seminar on Sanitary and Phytosanitary Measures



- March 2022
- 100 participants from public and private sectors, academia, CAREC, FAO, IPPC, ITC, WTO, WOAH.
- Highlighted **GRPs** as essential for modernizing outdated SPS measures and improving global market access
- Emphasized **interagency coordination** and evidence-based policymaking anchored in the WTO SPS Agreement
- Showcased **tools and digital innovations** to support transparent, science-based SPS regulatory frameworks (e.g. STDF's *GRP Guide*, *e-certification*, *risk analysis tools*)
- Promoted **regional cooperation** and investment in SPS systems under the CAREC SPS Workplan 2021–2023

See: [ADB–WTO–Pakistan Seminar on Sanitary and Phytosanitary \(SPS\) Measures | CAREC Program Event](#)

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For more information, contact: stfdf@stfdf.net

ADB/STDF Virtual Seminar on Good Regulatory Practices to Improve Sanitary and Phytosanitary Measures



- May 2022
- 180 participants - Government authorities involved in food safety, animal and plant health and trade (mainly from Asia Pacific Region)
- Others involved in regional / national SPS capacity development projects and programmes
- Explored how **GRPs** support effective SPS measures and safe trade
 - Overview of **STDF's GRP Guide** – tools and practical processes
 - **Country case studies** (The Philippines, Sri Lanka, Bhutan) – challenges, key results, and lessons learned
 - **Regional cooperation** opportunities and ADB's role through subregional programs

See: [ADB/STDF Virtual Seminar on Good Regulatory Practices to Improve Sanitary and Phytosanitary Measures | STDF](#)

STDF | 2022/23

Putting GRPs into practice: Key takeaways

1. International standards (Codex, OIE, IPPC) are the starting point
2. National situations differ; one size does not fit all
3. Build awareness that encourages leadership on GRPs
4. Learn from good practices in other countries
5. At a minimum, ensure the basics: Consultation, coordination, transparency
6. Where feasible, use more sophisticated GRPs: Stock taking and regulatory mapping, RIA, etc.
7. Use tools offered by STDF partners, OECD and others
8. Take a whole-of-government approach

STDF | 2022/23

Find out more



Visit STDF website

www.standardsfacility.org

Apply for STDF funding (PPGs, Projects)

Find out the eligibility criteria

See examples of completed Projects/PPGs

Read the Guidance Note for Applicants

Consult with regional/national stakeholders

Use STDF good practices

Publications, briefing notes, videos, etc.

Sign up for STDF e-news

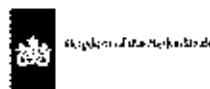
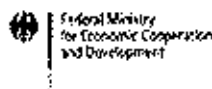
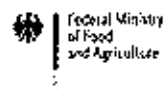
Join STDF events/webinars, share information
and learn from others

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Thank You

A GLOBAL PARTNERSHIP TO FACILITATE SAFE TRADE



STANDARDS *and* TRADE
DEVELOPMENT FACILITY



International Organization
for Standardization
ISO



WORLD BANK GROUP



World Health
Organization



World Organization
for Animal Health
WOAH



United Nations
Development
Programme



Australian Government
Department of Agriculture,
Fisheries and Forestry



Charles Sturt
University

Biosecurity Training Centre

Facilitator: Professor David Mackay

Topic: Building regulatory biosecurity workforce capability

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The Biosecurity Training Centre

- Partnership between Department of Agriculture, Fisheries and Forestry and Charles Sturt University.
- Commenced March 2022
- Currently delivering 12 short courses - ½ to 5 days in length
- Domains include biosecurity, regulatory, compliance, data, projects, operational management and leadership
- Approximately 3,000 officers have been trained in Australia and the Asia-Pacific

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Why Capability Development Matters

- Effectiveness and efficiency of biosecurity operations.
- Achievement of organisational outputs and outcomes
- Effective performance depends on strong knowledge, skills and abilities (KSA).
- A KSA framework supports officers across career stages.

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What are Knowledge, Skills, & Abilities?

- **Knowledge:** Theory, legislation, policy.
- **Skills:** Practical techniques, procedures.
- **Abilities:** Applying knowledge and skills effectively

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- [illegible]

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Critical Skills

Examples of critical **skills**:

- Inspection and detection.
- Risk assessment and decision-making.
- Communication and engagement.
- Data recording and evidence collection.

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Essential Abilities

Examples of essential **abilities**:

- Judgement under uncertainty.
- Handling complex situations.
- Independent and collaborative work.
- Adapting to new threats and technology.

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Biosecurity Officer - Foundational

KSA Level	Knowledge	Skills	Abilities
Foundational	<ul style="list-style-type: none"> Awareness of biosecurity frameworks, and understanding of legislative powers Understanding of operational roles in import biosecurity Familiarity with biosecurity pests and diseases Foundational knowledge of decision support material 	<ul style="list-style-type: none"> Entry-level risk assessment Use of core systems and simple diagnostic tools Communication and interpersonal skills for public interactions Record keeping and data entry 	<ul style="list-style-type: none"> Ability to understand and apply standard operating procedures Basic problem-solving in operational settings Physical and mental alertness, and curiosity Ability to work in a team under supervision

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Biosecurity Officer - Intermediate

	Knowledge	Skills	Abilities
Intermediate	<ul style="list-style-type: none"> Detailed knowledge of biosecurity policies and compliance frameworks Detailed understanding of biosecurity operations Knowledge of stakeholder roles Regulatory communication and report writing 	<ul style="list-style-type: none"> Operational decision-making skills Independently conducting assessments, audits and non-compliance actions Data analysis and intelligence gathering skills Problem-solving in complex operational contexts 	<ul style="list-style-type: none"> Ability to manage small teams Capacity to independently manage routine operations Ability to perform under pressure and in high-risk contexts Ability to ensure compliance with legal frameworks and standards

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Biosecurity Officer - Mastery

	Knowledge	Skills	Abilities
Mastery	<ul style="list-style-type: none"> Comprehensive knowledge of biosecurity regulations and operations Expertise in planning and implementing biosecurity operations Expertise in implementing compliance strategies 	<ul style="list-style-type: none"> Leading complex operations and non-compliance activities Team management and workforce development Policy implementation and operational decision-making 	<ul style="list-style-type: none"> Strategic thinking and ability to plan regulatory activities Ability to manage multidisciplinary teams Ability to provide high-level advice on biosecurity to government, executive and industry

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Why Use a KSA Framework?

- Structured development.
- Aligns capabilities with needs.
- Supports career and workforce planning.
- Strengthens biosecurity system.

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Questions

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REPUBLIC OF TÜRKİYE MINISTRY OF AGRICULTURE AND FORESTRY

General Directorate of Food and Control

Biosecurity Implementations of Türkiye



BASIS ACTIVITIES

Ministry of Agriculture and Forestry

Law on Veterinary Services, Plant Health, Food and Feed (No: 5996, June 11, 2010)

Veterinary services

- *public health,
- *plant and animal health,
- *animal breeding and welfare,
- *consumer interests and the environment,
- *thus ensuring food and feed safety.

Plant health

Food and feed

Ministry of Agriculture and Forestry

Our mission, to determine policies:

to protect;

- agriculture,
- forest and water resources,
- natural ecosystems,

to ensure;

- efficient and sustainable agricultural production,
- access to sufficient and reliable food,
- sustainable development.



AFFILIATED - RELATED ORGANIZATIONS

Ministry of Agriculture and Forestry

AFFILIATED ORGANIZATIONS

- Atatürk Forest Farm Directorate
- General Directorate of State Hydraulic Works
- General Directorate of Nature Conservation and National Parks
- General Directorate of Forestry
- Turkish Water Institute

RELATED ORGANIZATIONS

- General Directorate of Tea Enterprises
- General Directorate of Meat and Milk Institution
- General Directorate of Agricultural Enterprises
- Agricultural and Rural Development Support Institution
- General Directorate of Soil Products Office
- General Directorate of Turkish Sugar Factories Inc.

*49 research institutes for the protection of plant and animal life and biosecurity facilities

3



BASIS ACTIVITIES

General Directorate of Food and Control - GDFC

Protection of Consumers and
Environment



Plant Health



Animal Health and Welfare



Food and Feed Safety



Risk Assessment

General Directorate of Food and Control

*to establish policies,

*to ensure reliable food and feed supply and supervise their implementation,

*to protect consumer and public health by ensuring plant & animal health and food and feed safety

*to determine import conditions of plant & animal and their products and food and feed,

*to carry out export controls according to the requirements of importing countries,

*to conduct training and supervision activities of officials and facilities,

4



DIRECTLY AFFILIATED DIRECTORATES

General Directorate of Food and Control *From Farm to Table Food Safety*

Veterinary Control
Institute Directorates

Food Control
Laboratory
Directorates

23

9

14

41

Veterinary Border
Control Point
Directorates

Agricultural Quarantine
Directorates



5



PHYTOSANITARY & QUARANTINE



control of
plant
diseases
and pests



approval,
licensing
and
inspection
of plant
protection
products



plant
quarantine



plant
passport



import and
export
operations
of plants
and plant
products



pre-harvest
pesticide
control

5



ANIMAL HEALTH



control of
animal
diseases
and pests



identification
and
registration
of animals -
control of
animal
movements



import
and
export
controls of
animal
products



approval,
licensing
and
inspection of
veterinary
health
products



monitoring
of zoonotic
diseases
and
antimicrobial
resistance



transport
and
slaughtering
of animals



FOOD AND FEED RELIABILITY



preparation of
Turkish Food
Codex



approval
and
registration
of food
businesses



registration of
businesses
producing
food contact
substances
and materials



supplementar
y food



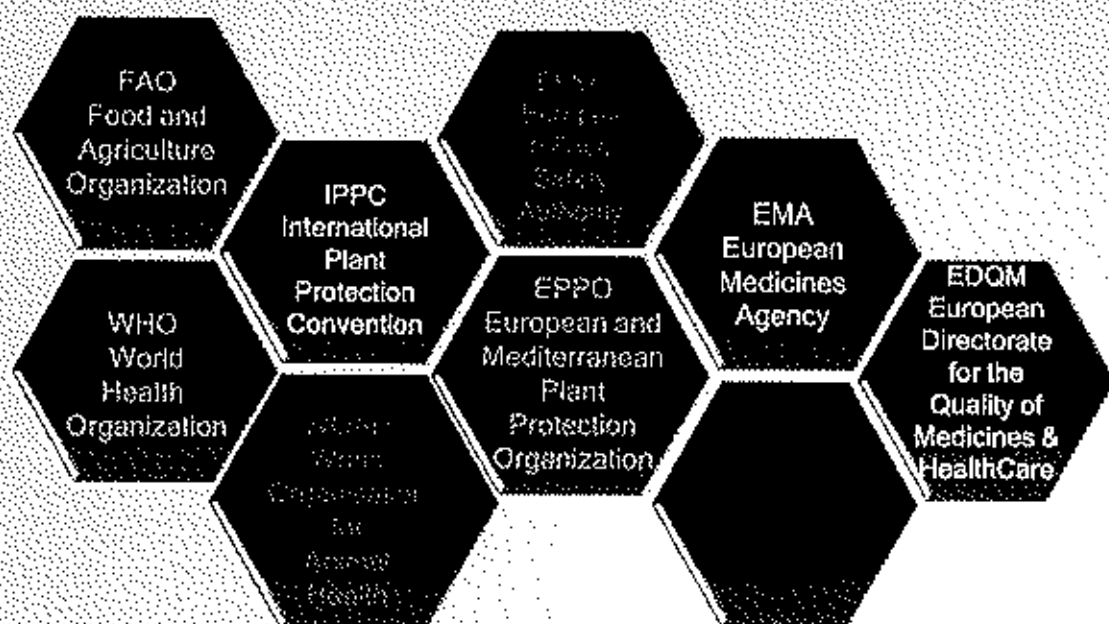
approval and
registration
of feed
businesses
&
approval of
feed
additives



food and
feed
inspection



COOPERATED INTERNATIONAL ORGANIZATIONS



PHYTOSANITARY PRACTICES

Türkiye;

- Bridge between Europe and Asia
- Diversity of fauna and plant species ($\approx 12,000$)
- Control of 661 harmful organisms

Ministry of Agriculture and Forestry;

- survey instructions for harmful organisms subject to quarantine.
- discovery and limitation surveys under the coordination of Regional Research Institute Directorates.



Survey Studies

Candidatus Liberibacter spp.
(Citrus Greening Bacterium)
Xylella fastidiosa
Plum pox potyvirus
Anoplophora chinensis
Monilinia fructicola
Spodoptera frugiperda
Tomato brown rugose fruit virus
Pepino mosaic virus
Tomato spotted wilt virus
Peach latent mosaic viroid etc.



PEST AND PESTICIDE MANAGEMENT

Integrated Pest Management (IPM) Integrated and Controlled Product Management (ICPM) "safe food from farm to table"

- *pesticide residue-free vegetable and fruit production,
- *healthy, reliable and traceable plant production,
- *protection of environment and human health

ICPM's basic components:

1. Integrated: All agricultural production practices,
2. Control: Monitoring, inspection, evaluation, analysis and documentation,
3. Product: Fresh fruits and vegetables,
4. Management: Planning, organization, training, implementation,

marketing

Products within the scope of ICPM project:

tomato, pepper, eggplant, cucumber, lettuce, cumin, thyme, mint, corn
peach, apricot, cherry, plum, apple, pear, quince, grape, citrus, strawberry, fig



PEST AND PESTICIDE MANAGEMENT

ICPM's benefits:

- *Obtaining reliable products
- *Reducing costs and increasing profitability
- *Protecting and supporting natural enemies
- *Training technical staff and producers
- *Ensuring timely and effective control with periodic checks
- *Managing pesticide consumption with the Producer Registry
- *Establishing a monitoring and control system
- *Certifying products,
- *Developing production techniques for the world market
- *Protecting the environment and natural balance
- *Ensuring sustainable production
- *Developing cooperation with private sector, civil society organizations





PEST AND PESTICIDE MANAGEMENT

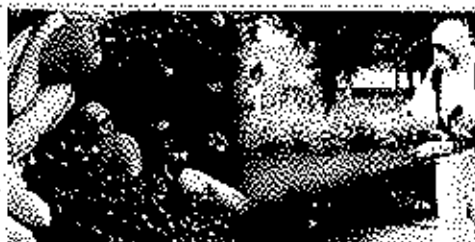
Residues Action Plan (RAP) - 2022-2027

Products: Pepper, citrus, leafy vegetables, vineyard, pomegranate, quince, tomato

Pilot regions: Adana, Ankara, Antalya, Aydın, Burdur, Bursa, Denizli, Eskişehir, Hatay, İzmir, Manisa, Mersin, Muğla, Sakarya, Tokat

To ensure control of pesticide residue;

- Establishment of working groups
- Training of technical personnel and producers
- Demonstration activities in cultural control, biological and biotechnical control practices
- Monitoring of pest population
- Inspection activities (before harvest and at the vegetable and fruit sales points)
- Audits of Plant Protection Products sales points



PEST AND PESTICIDE MANAGEMENT

Action Plans for Harmful Organisms;

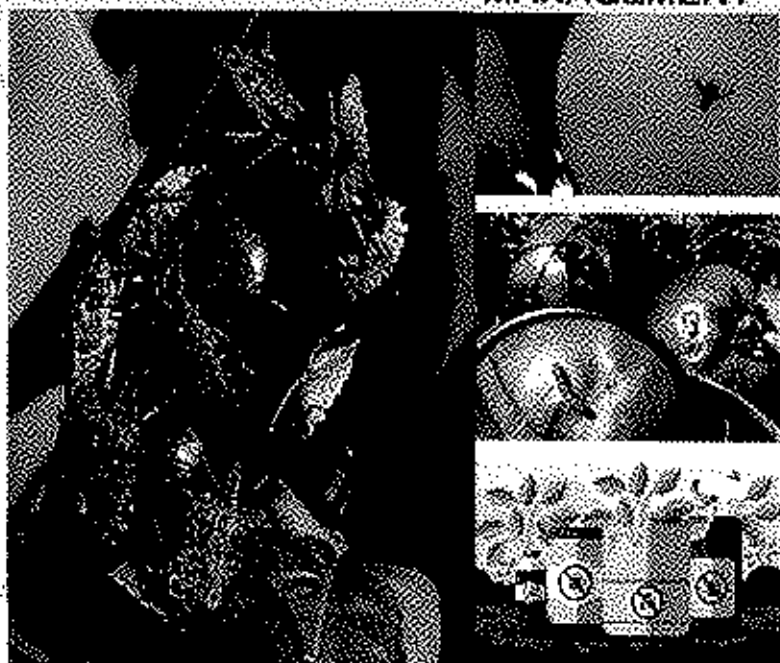
Mediterranean Fruit Fly Control National Action Plan
(*Ceratitis capitata*)

Brown Marmorated Stink Bug Action Plan
(*Halyomorpha halys*)

Tomato Moth Action Plan
(*Tuta absoluta*)

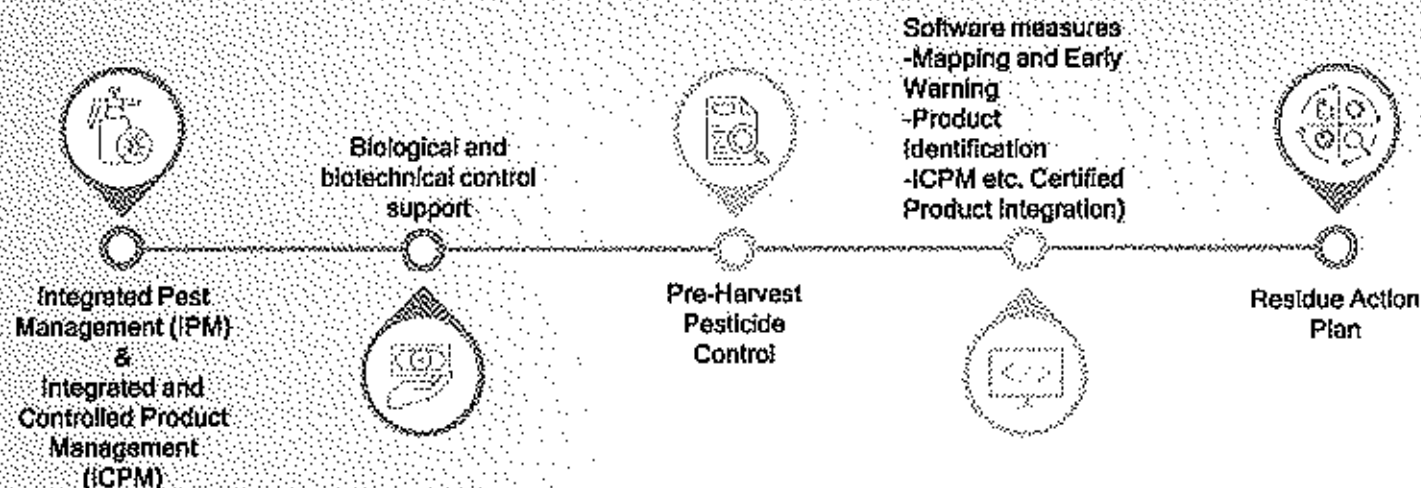
Cooperation is made with;

- municipalities
- relevant Ministries (Trade and Environment etc.)
- producers and Producer Unions
- packaging facilities, export companies
- non-governmental organizations





PESTICIDE RESIDUE CONTROL ACTIVITIES



15



IMPORT & EXPORT INSPECTIONS

Law No. 5996 on Veterinary Services, Plant Health, Food and Feed (11/6/2010)

- Plant Quarantine Regulation (*Official Gazette Date: 03.12.2011 - Number: 28131*)
- Plant Quarantine Inspector Regulation (*Official Gazette Date: 21.04.2011 - Number: 27912*)
- Plant Quarantine Fumigation Regulation (*Official Gazette Date: 19.06.2011 - Number: 27969*)
- Regulation on Thermal Treatment and Marking of Wooden Packaging Materials (*Official Gazette Date: 26.07.2024 - Number: 32613*)
- Plant Quarantine Sampling Instruction (*02.03.2012 - 7404*)
- Communiqué on the Determination of Customs Administrations Authorized for the Entry of Certain Products Subject to the Control of the Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Authorized to Conduct Official Controls (*05.10.2013 and numbered 28786 (Amended phrase: RG-28/7/2021-31551)*)
- Communiqué on Import Control of Products Subject to the Control of the Ministry of Agriculture and Forestry (*Product Safety and Control: 2025/5*)



IMPORT & EXPORT INSPECTIONS Department of Plant and Plant Products Border Controls-

training and authorization

- inspectors
- fumigation operators
- heat treatment operators
- consultant agricultural engineers of enterprises

audit

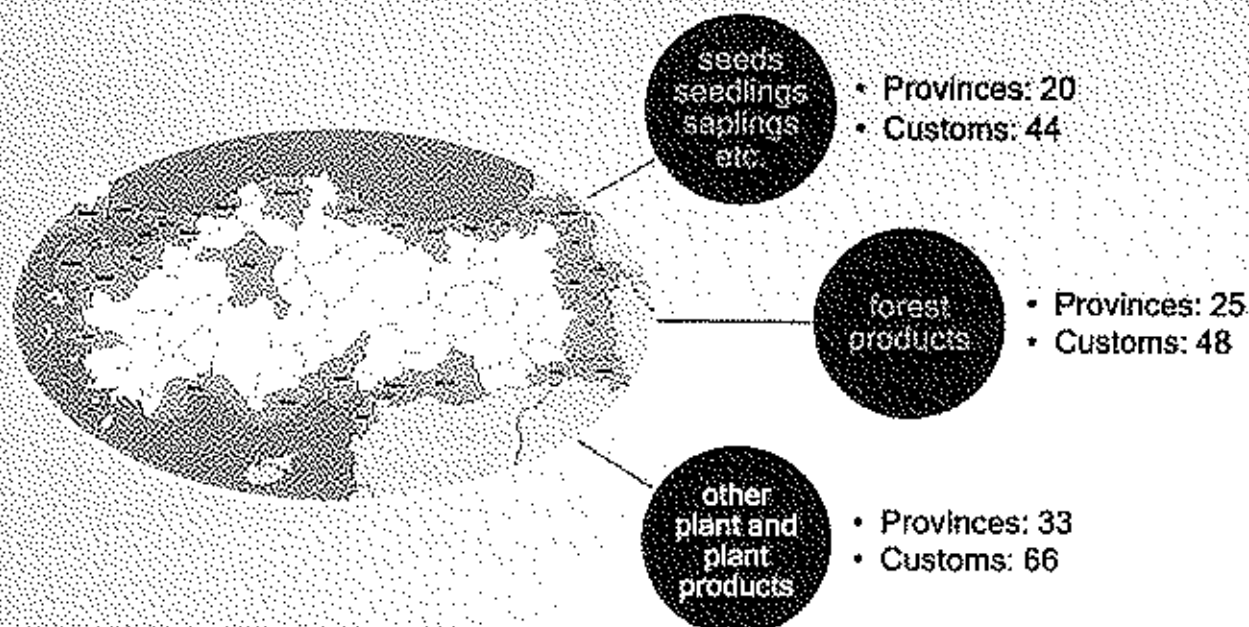
- provincial directorates
- packaging facilities
- heat treatment businesses
- businesses that practice fumigation

authorities

- quarantine inspections & issuing PC
- establishment and authorization of plant products border control gates
- determine import conditions
- establishing quarantine rules
- creating a quarantine pest list
- international relations and mutual agreements on quarantine issues



IMPORT & EXPORT INSPECTIONS Department of Plant and Plant Products Border Controls





1. Ürün ve ihracat bilgileri Ürün Adı: ... Ürün Türü: ... Ürün Kaynağı: ... Ürün Ağırlığı: ... Ürün Boyutu: ... Ürün Durumu: ...		2. Ürünün menşei bilgileri Ürün Menşei: ... Ürün Menşei Adresi: ... Ürün Menşei Telefonu: ... Ürün Menşei E-postası: ... Ürün Menşei Web Sitesi: ...	
3. Ürünün kalite ve miktar bilgileri Kalite: ... Miktar: ... Miktar Birimi: ... Miktar Toleransı: ... Miktar Toleransı Oranı: ...		4. Ürünün sağlık bilgileri Sağlık Durumu: ... Sağlık Kontrolü: ... Sağlık Kontrolü Tarihi: ... Sağlık Kontrolü Yeri: ... Sağlık Kontrolü Sonucu: ...	
5. Ürünün taşıma bilgileri Taşıma Yolu: ... Taşıma Aracı: ... Taşıma Aracı No: ... Taşıma Aracı Tescilli: ... Taşıma Aracı Tescilli Tarihi: ... Taşıma Aracı Tescilli Yeri: ...		6. Ürünün diğer bilgileri Diğer Bilgi: ... Diğer Bilgi: ... Diğer Bilgi: ... Diğer Bilgi: ...	

Plant and plant products;

Phytosanitary Certificate

- Free from plant diseases and harmful organisms
- Compliant with the phytosanitary requirements of the importing country

Processed plant products, contact substances and materials;

Health Certificate

- Pesticide, Contaminants, GMO in terms of appropriate

Export certification

1. Ürün ve ihracat bilgileri Ürün Adı: ... Ürün Türü: ... Ürün Kaynağı: ... Ürün Ağırlığı: ... Ürün Boyutu: ... Ürün Durumu: ...		2. Ürünün menşei bilgileri Ürün Menşei: ... Ürün Menşei Adresi: ... Ürün Menşei Telefonu: ... Ürün Menşei E-postası: ... Ürün Menşei Web Sitesi: ...	
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10



Bildiğiniz Sağlık Sertifikası (BSS) Türkiye Ulusal Bitki Koruma Servisi tarafından düzenlenmiştir.
 [The Phytosanitary Certificate has been issued by the Türkiye National Plant Protection Service.]
 Ürün Türkiye'den çıkış yapmıştır.
 [The Product Did Not Exit From Türkiye.]

Bildiğiniz Sağlık Sertifikası (BSS) Türkiye Ulusal Bitki Koruma Servisi tarafından düzenlenmiştir.
 [The Phytosanitary Certificate has been issued by the Türkiye National Plant Protection Service.]
 Ürün Türkiye'den çıkış yapmıştır. [The Product Exit From Türkiye.]
 Aşağıdaki Tablodaki "Çıkarılan Ürünler Miktarları" olarak belirtilen Ürünler Türkiye'den çıkış yapmıştır.
 [The products indicated as "Exported Quantity" in the table below were exported from Türkiye.]

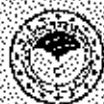


PC Verification & Customs Exit Traceability

- ✓ QR code
- ✓ <https://abs.terbil.gov.tr/Main/PhytosanitaryCertificate>

1. Ürün ve ihracat bilgileri Ürün Adı: ... Ürün Türü: ... Ürün Kaynağı: ... Ürün Ağırlığı: ... Ürün Boyutu: ... Ürün Durumu: ...		2. Ürünün menşei bilgileri Ürün Menşei: ... Ürün Menşei Adresi: ... Ürün Menşei Telefonu: ... Ürün Menşei E-postası: ... Ürün Menşei Web Sitesi: ...	
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10



Methyl Bromide (MeBr) practices

In order to minimize the use of MeBr,

- Fumigation with MeBr in Re-Export is prohibited as of April 1, 2024. (G/SPS/N/TUR/142)
- MeBr is applied only in the export of products produced in Türkiye.
- The Regulation on Reducing the Use of Methyl Bromide in Agriculture (June 23, 2000)



21



«The Evolution of Biosecurity Regulation: Past, Present and Future»

- Agricultural production is based on soil, water and natural balance.
- The world's soil, water, forest and energy resources are being depleted.
- Sustainable production depends on the protection of natural resources.
- Biosecurity measures ensure the sustainability of agricultural production.
- Biosecurity is critical for the entire world.
- Biological & Biotechnical Control in plant production should be supported for human and environmental health.
- Biosecurity measures requires international cooperation.





Republic of Türkiye
The Ministry of Agriculture and Forestry
General Directorate of Food and Control

<https://www.tarimorman.gov.tr>

<https://www.tarimorman.gov.tr/GKGM>

nppoturkiye@tarimorman.gov.tr

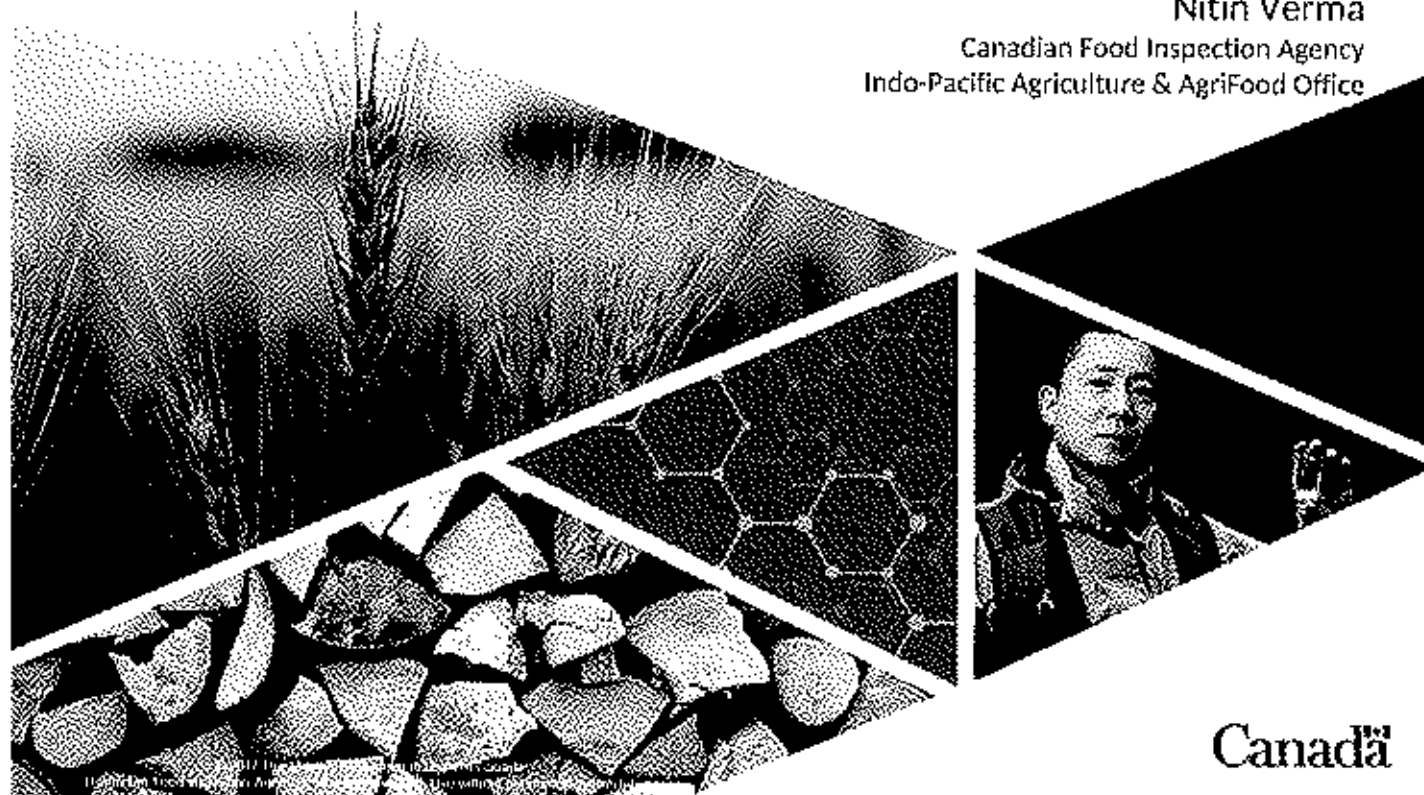
*Thank
you*

Şehriban Gören
Agricultural Engineer, Coordinator
Department of Plant and Plant Products Border Control
sehriban.goren@tarimorman.gov.tr

Systems Approach for Phytosanitary Risk Management

Nitin Verma

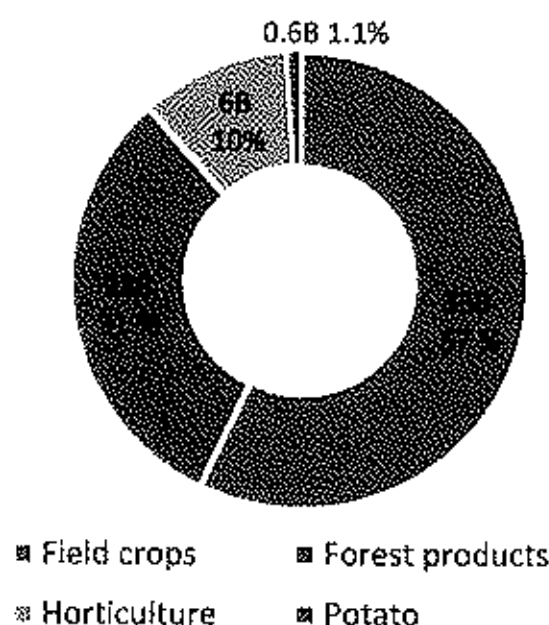
Canadian Food Inspection Agency
 Indo-Pacific Agriculture & AgriFood Office



Canada

UNCLASSIFIED | NON CLASSIFIÉ

Canada's plants, plant products and forest products export 2023



- Total Value: 57.6 Billion CAD\$
- Canada exported plant and plant products to 173 countries.
- In most cases, export certification is based on systems approaches, (making treatments such as fumigation redundant).

Export Certification

General

The CFIA issues Phytosanitary Certificates that:

- Follow the International Plant Protection Convention (IPPC) model (ISPMs 7 and 12);

AND

- Are in accordance with Canadian legislation (*Plant Protection Act* and *Plant Protection Regulations*), and CFIA policy directive D-99-06 on the issuance of phytosanitary certificates and phytosanitary certificates for re-export;

AND

- Are consistent with the phytosanitary import requirements of trading partners.

UNCLASSIFIED | NON CLASSIFIÉ

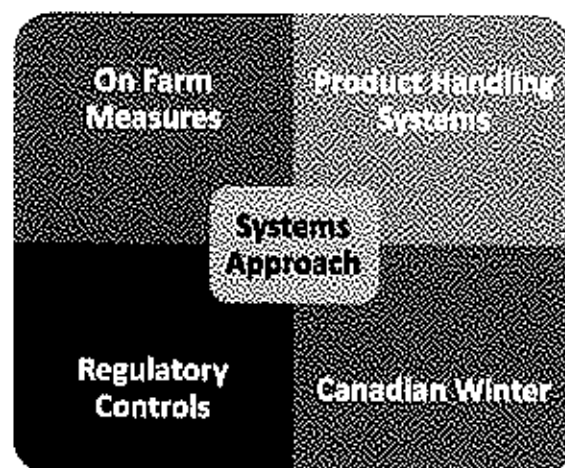
Export Certification

General

- Export certification requires detailed information on current phytosanitary import requirements of trading partners.
- The CFIA maintains importing countries' phytosanitary requirements in an internal database.
- Issuance of phytosanitary certificates is based on:
 - inspection/testing of representative samples;
 - inspection of individual consignments; and/or
 - inspection of exporting facilities
 - Specific export certification programs (e.g. systems approach-based pest risk mitigation)

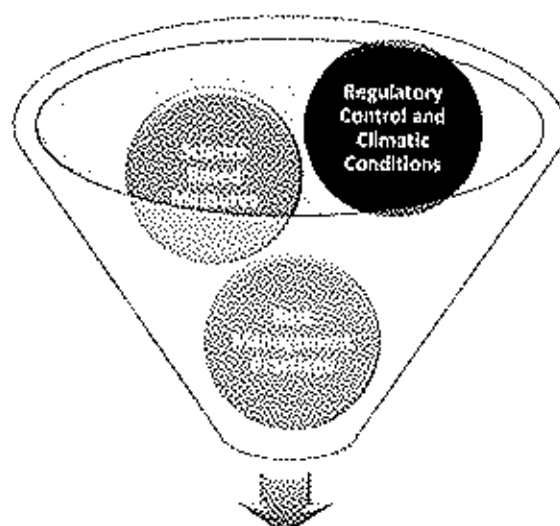
Systems Approach?

A pest risk management option that integrates different measures, at least two of which act independently, with cumulative effect
(ISPM 14)



UNCLASSIFIED | NON CLASSIFIÉ

Canadian Systems Approach to Pest Management



Canadian Systems Approach

Examples:

- Forestry
- Horticulture
- Grains

Forestry



Wood Chips in Eschbach, PA • Zimmerman North CFIA



Overview- Forestry Programs

Use of Systems Approaches in CFIA Forestry Certification Programs

Canadian Heat-Treated Wood Products Certification Program (HT program)

Canadian Debarking and Grub Hole Control Program for the export of cedar wood products

Canadian Sawn Wood Certification Program



HT Program

- A phytosanitary certification program administered by the CFIA.
- Establishes the requirements for facilities registered under the program to produce and/or handle wood that has been heat treated to a minimum core temperature of 56° C for a minimum of 30 minutes.
- Also applies to the production of wood packaging material in accordance with the provision of ISPM 15.
- Provides a basis for meeting foreign phytosanitary import requirements for heat treated wood products.

9

Alternative Service Delivery (ASD)

- Three third-party ASD organizations are recognized by the CFIA to supervise and audit facilities operating under the HT program :
 - CLSAB – Canadian Lumber Standards Accreditation Bureau
 - CWPCA – Canadian Wood Pallet and Container Association
 - QWEB – Quebec Wood Export Bureau
- Third party ASD organizations are subject to CFIA oversight and audits to verify that facilities under their supervision comply with specific and documented program requirements:
 - Competency, Heat Treatment, Wood Packaging, Traceability, Segregation, Documentation & Record-Keeping, Corrective Actions





Cedar Debarking Program (D-07-02)

- Establishes the requirements for facilities registered under the program to produce cedar products that do not contain bark or grub holes caused by native Cerambycid beetles in the genus *Monochamus*.

Sawn Wood Program (D-17-04)

- A system-based phytosanitary certification program administered by the CFIA for export of untreated and kiln-dried sawn wood products.

11

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Horticulture Products

- Canada follows a systems approach to certify fresh peppers, cherries, blueberries, and apples for export to various markets worldwide, including the European Union, Taiwan, Japan, and China
- These commodities have been successfully exported for many years without any reports of pest detections by importing countries.
- Greenhouse Certification Program



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- Mitigation measures during production, packing and export inspection. This combination provides a robust pest risk mitigation approach when pest free areas can't be used and include:
 - Mandatory registration with the CFIA of growers and packing facilities
 - pest monitoring (trapping and visual surveys)
 - Treatments (e.g., pesticide sprays)
 - Traceability measures
 - Sorting, Packing, Labelling, Storage and Transport requirements
 - Export inspection and certification by the CFIA (may include brown sugar test)
 - Record keeping by growers and packing facilities
 - Pest monitoring, spray records, etc.

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Canada's Systems Approach to Grain Export

- Canada utilizes a systems approach to pest management in the grain sector
- This involves collaboration between the CFIA, Canadian Grain Commission, Provincial Governments and the grain industry (Producers, Processors and exporters)
- Accepted by many countries for imports of Canadian grain
 - e.g. China, Japan, S Korea, Peru and Mexico

Canada's Systems Approach

Major critical risk mitigation control points in the Canadian grain handling and export system:

- 1) On-farm prevention, monitoring, identification and management of pests
- 2) Utilization of cold winter temperatures as natural pest control for stored grain insects.
- 3) Grain elevator inspection program
- 4) Ship inspection program
- 5) Official sampling and testing of export shipments



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On-Farm Measures

- Keep it Clean Program
- Weed management: cultural practices, herbicide use
- Disease Management: e.g. use of disease resistant varieties, seed treatment, etc.
- On-farm stored product pest management
 - Bin sanitation
 - Monitoring of grain (temperature and moisture)
 - Cold treatment: aeration
 - Chemical treatment if needed

Keep it Clean Program

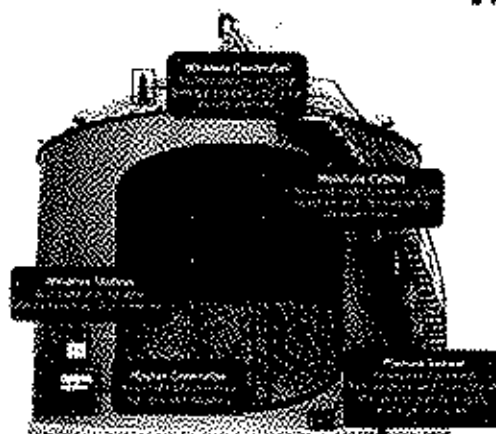
Keep it Clean is a joint initiative of the Canola Council of Canada, Cereals Canada, Pulse Canada, and the Prairie Oat Growers Association, providing growers and crop advisers with resources for growing market-ready crops. This includes providing timely updates on potential market risks and resources for on-farm practices to ensure crops meet the standards of domestic and export customers.

Program Partners:

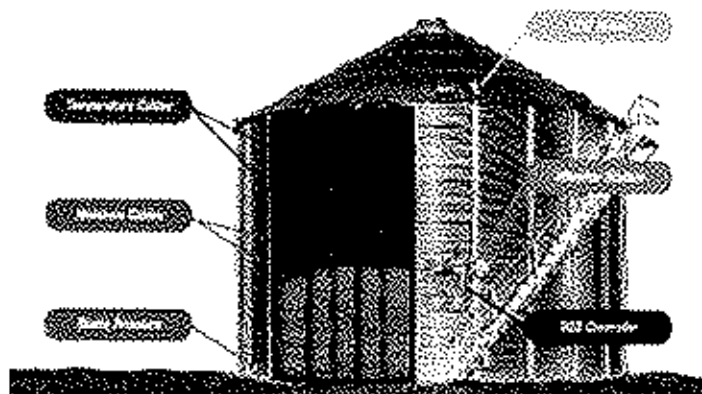
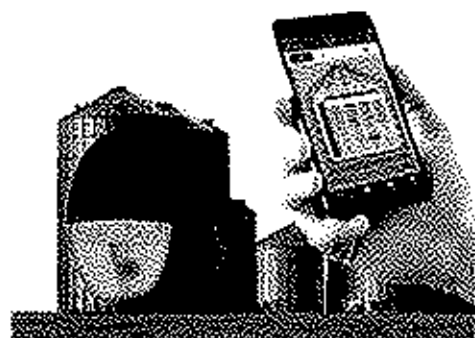


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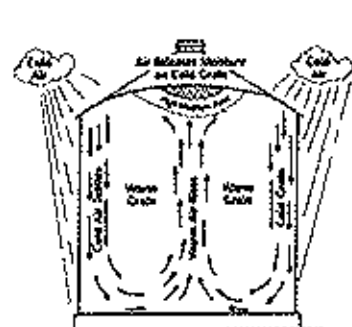
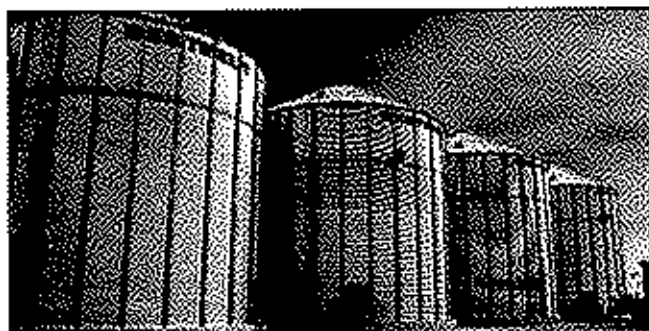
Monitoring



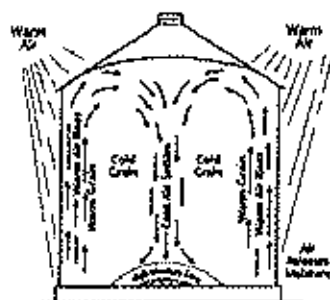
Remote insect monitoring via:
CO2 sensor
Temperature sensor



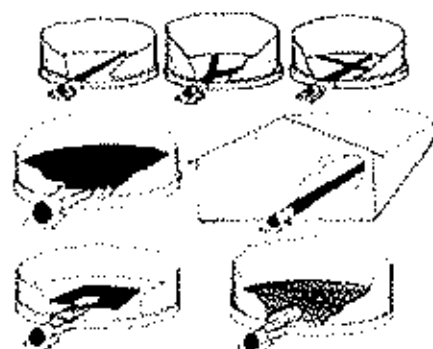
Aeration



Fall and Winter

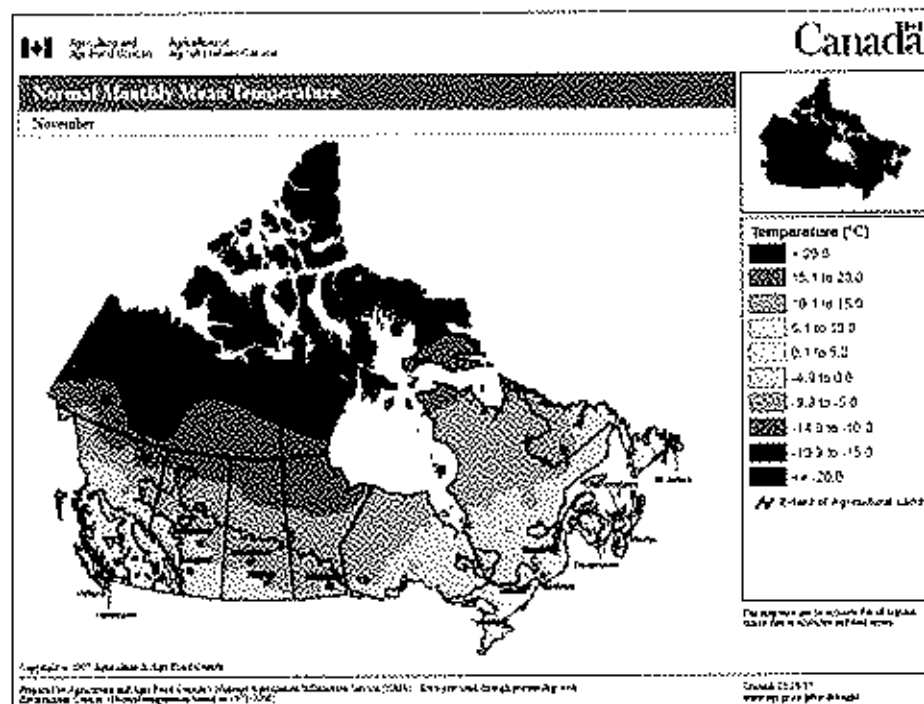


Spring and Summer



19

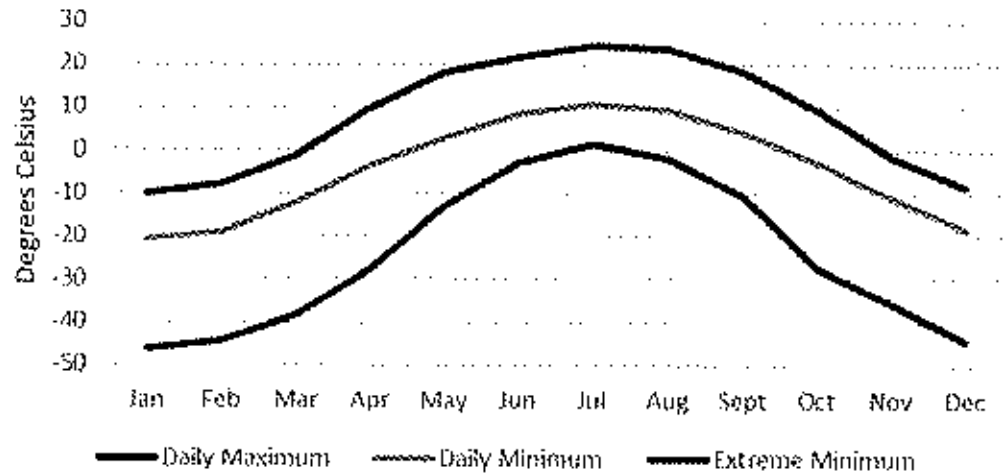
Climate



How cold is it?



1991 to 2020 Canadian Climate Normals Data for North Battleford, SK*

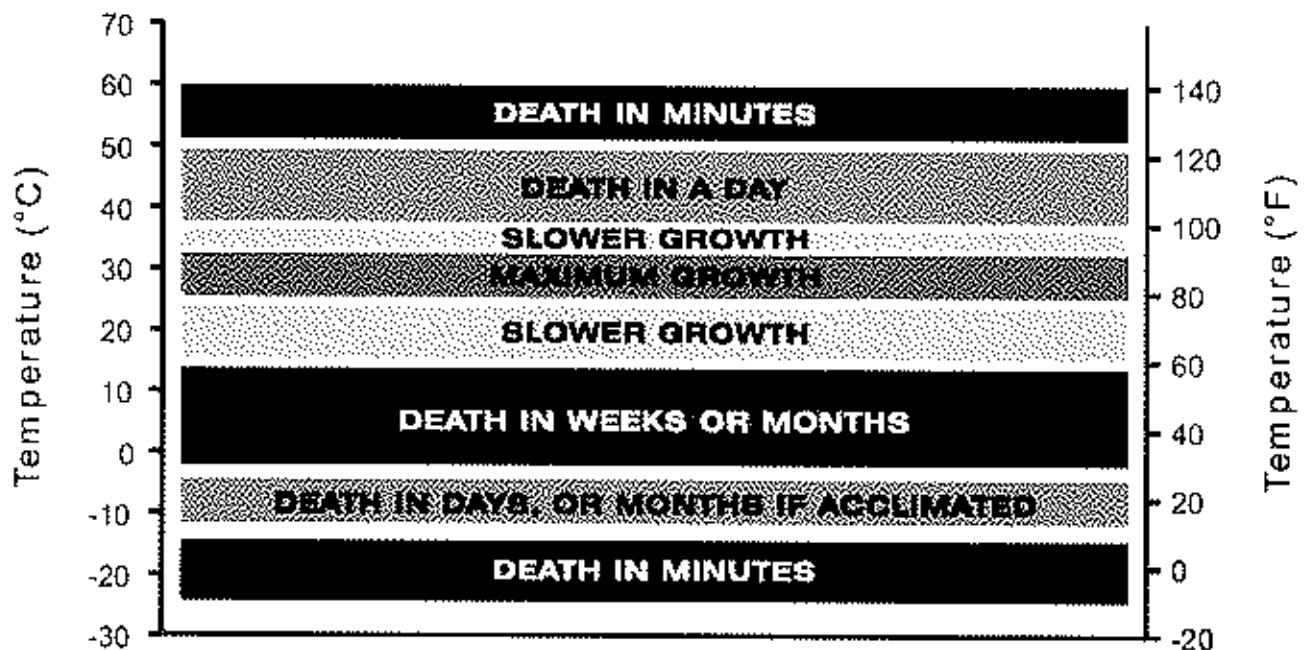


*Source: Environment Canada

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Temperature Effects on Insects



*Source: Agriculture and Agri-Food Canada

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Regulatory Controls

Plant Protection Act:

- Section 7: No person shall import or admit into Canada or export from Canada any thing that is a pest, that is or could be infested with a pest or that constitutes or could constitute a biological obstacle to the control of a pest . . .

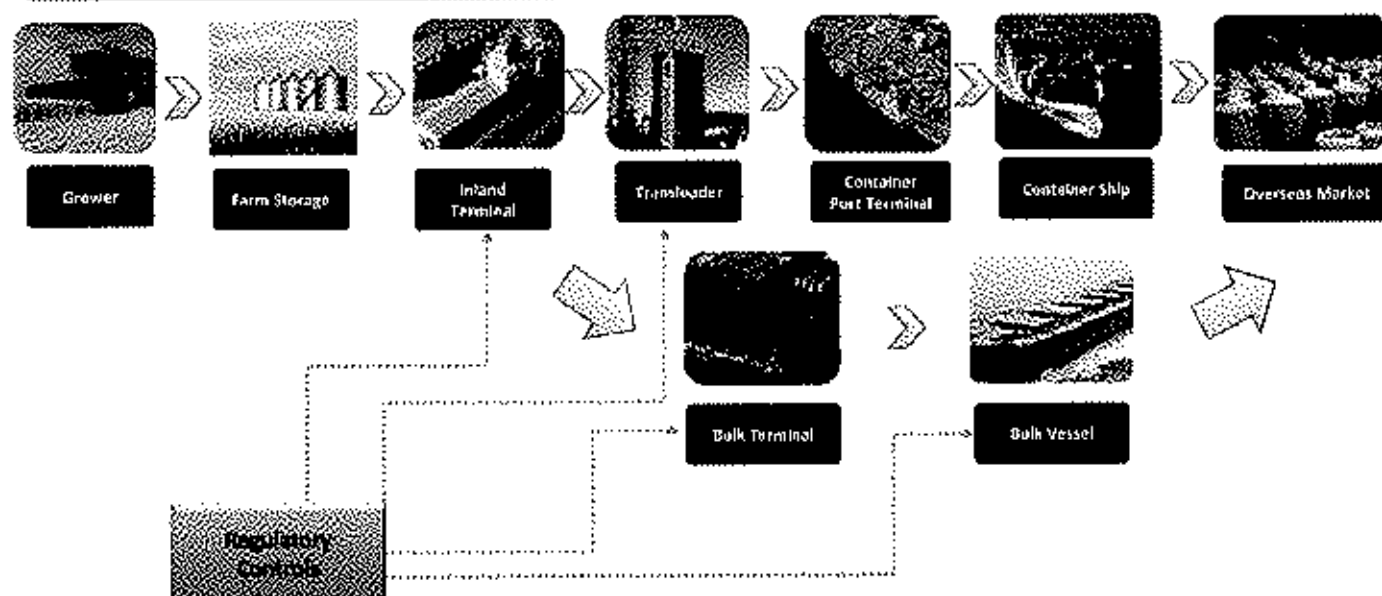
Plant Protection Regulations:

- Section 55 (2): No person shall export from Canada any thing for which a Canadian Phytosanitary Certificate, Canadian Phytosanitary Certificate for Re-export or any other document is required by the phytosanitary certification authorities in the country of final destination, unless the appropriate document is issued by an inspector.
- Section 57: No person shall export or re-export any thing from Canada unless it meets the laws of the importing country respecting phytosanitary import requirements.

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Grain Export Process Flow

From Farm to a Canadian Port



Primary Grain Elevators

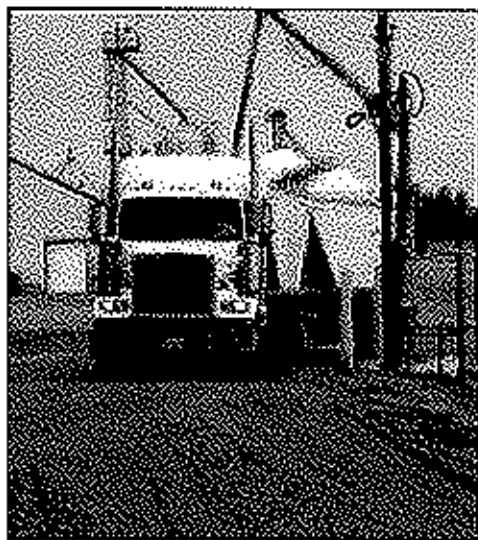
- Located in the areas of grain production
- Delivery radius of up to 200 kilometers
- For example, 342 inland elevators in W. Canada.
- Licensed by CGC.
- Information available on the CGC website



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Producer Delivery to Primary Grain Elevators



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Inspection of Incoming Grains



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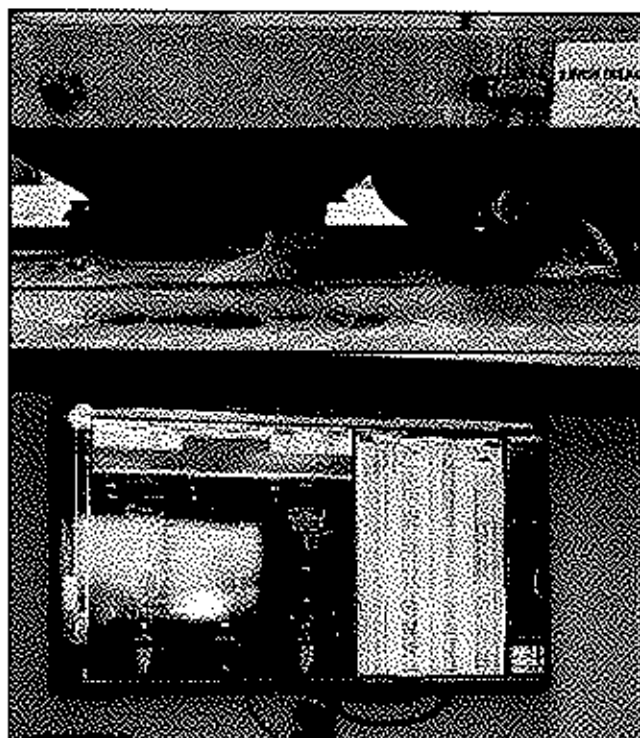
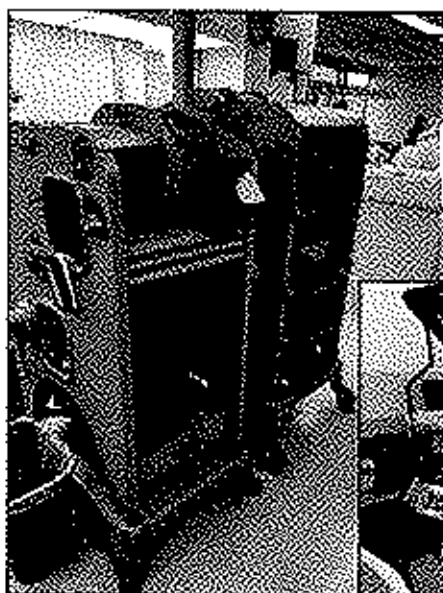
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Unloading Grain at Primary Elevator



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Grain Unloading at Terminal Elevator



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Terminal Elevators

- Terminal (port) elevators receive grain from primary elevators
- Load ocean vessels
- 34 in Canada, 10 in British Columbia
- Inspected/approved by CFIA and CGC



Grain Elevator Inspection

Section 57 (d) of the *Canada Grain Act* states that a licensed elevator operator cannot receive infested grain into the elevator.

Section 76 (1) of the *Canada Grain Act* states that the identification of any infested grain in a licensed terminal or transfer elevator requires notification of the CGC.



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Grain Elevator Inspection

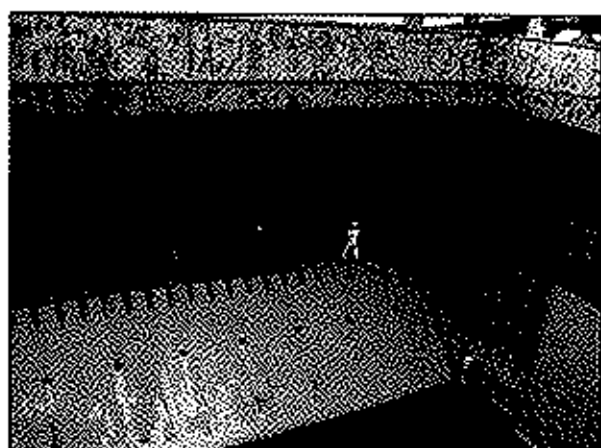
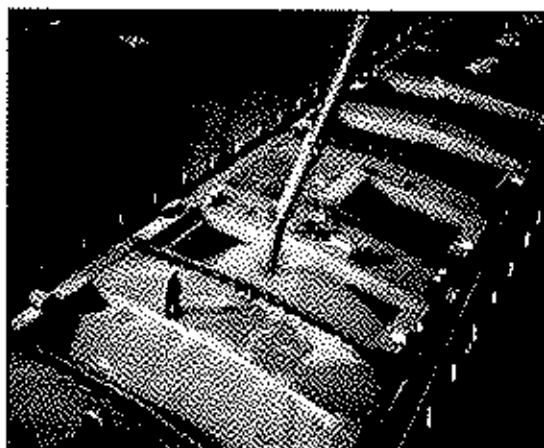
Terminal elevators and transfer elevators are inspected by trained CFIA or CGC inspectors, under the authority of the *Plant Protection Act and Regulations*.

- Inspections conducted at 6 week intervals
- Frequency of inspections increases if non-conformances are identified
- Elevators are assigned a rating; a standard rating is required to be eligible to export grain
- Pest detections require immediate action as per the inspectors instructions



Ship Inspection

Section 58 (1) of Canada's *Plant Protection Regulations* states that the inspection of ocean vessels by a CFIA inspector is mandatory.

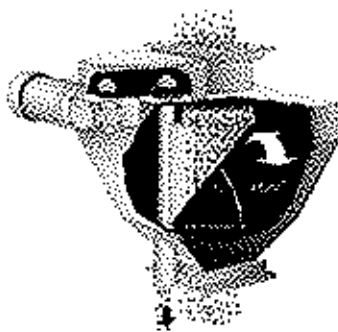


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Sampling and Testing

- Sampling and testing is conducted as per the phytosanitary requirements of the importing country.
- CFIA issues the phytosanitary certificate only if the importing country requirements are met.



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Canadian Grain Commission stored product pests detections in grain export samples (5 Year Data)

Commodity	No. of Samples	Number of positive detections	Spp. Detected
Wheat	6378	2	Primary insect (Spp. name not available)
Lentil and Peas	6994	15	<i>Dermestes lardarius</i> (1), <i>Psocids</i> (14)
Canola	18,844	16	<i>Psocids</i> (7) <i>Tribolium confusum</i> (5) <i>Cryptolestes ferrugineus</i> (2) Mite(1) <i>Lepidoptera larva</i> (1)

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CFIA stored product pests detections in grain export samples (destination = all countries)

(Total grain samples tested: 23,444 from Aug 01, 2021 to July 31, 2022)

Crop Kind	Number of positive detections	Species identified
Wheat	3	<i>Cryptolestes sp. Larvae</i>
Chickpea	2	<i>Cryptolestes ferrugineus</i> <i>Reesa vespulae</i>
Millet	1	<i>Psocoptera</i>
Sunflower	1	<i>Reesa vespulae</i>
Bean	1	<i>Reesa vespulae</i>
Lentil	0	—
Pea	0	—

Use of pest survey to maintain pest free status or meet importing partners requirements

Crop Kind	Pest	No of samples	No. of positive detections
Lentil and Peas (2004 -23)	<i>Ditylenchus dipsaci</i>	24,283	0
Wheat (2008-22)	<i>Tilletia controversa</i>	1930	0
Wheat (2008-22)	<i>Tilletia indica</i>	1930	0
Alfalfa (2020-22)	<i>Clavibacter michiganensis subsp. insidiosus</i>	339	0

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Summary

- Science-based systems approaches are an effective method to mitigate plant pest risk in trade and export certification
- A combination of measures provides overlapping assurance and confidence in final phytosanitary status (validated by pest-detection data)

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Biosecurity systems: which way is up & how do we get there?

Andrew Robinson

CEBRA, University of Melbourne

May 1, 2025



Agenda

A simple view of biosecurity systems

Which way is up?

(Activity)

...and how do we get there?

Questions & Discussion

A simple view of biosecurity systems

Biosecurity system in a slide (V. 1)

[illegible]

What is the Biosecurity System for?

IGAB Objective 1

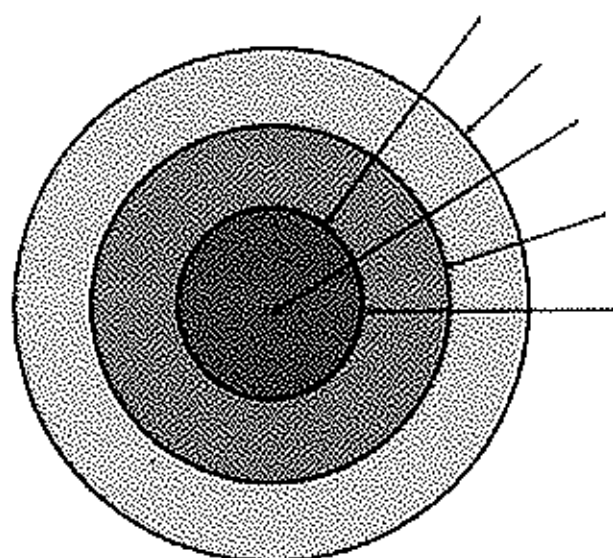
Reduce the likelihood of exotic pests and diseases, which have the potential to cause significant harm to the economy, the environment, and the community (people, animals and plants) from entering, becoming established or spreading in Australia.

But ...

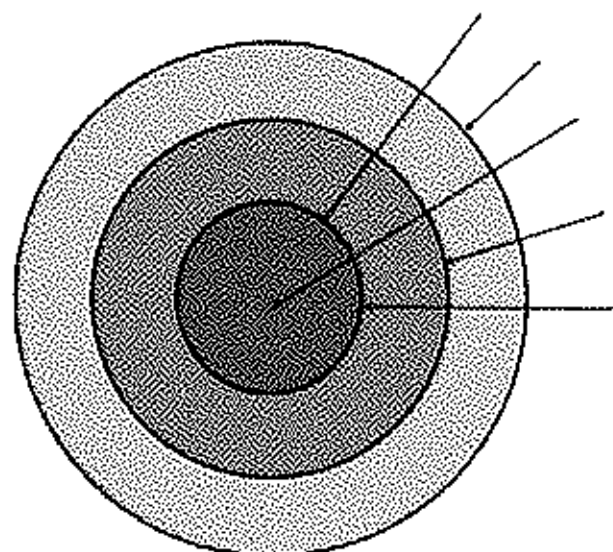
Sometimes, resistance is enough (more later)

Biosecurity system in a slide (V. 2)

A Familiar Lens



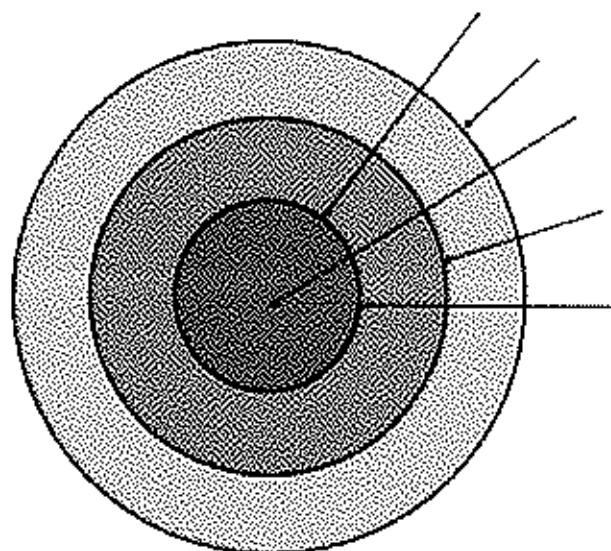
Biosecurity system in a slide (V. 2)



A Familiar Lens

- ▶ Pre-border
 - ▶ Establish, monitor risk mitigation
 - ▶ Anticipate risk changes
 - ▶ Expand border via partnerships

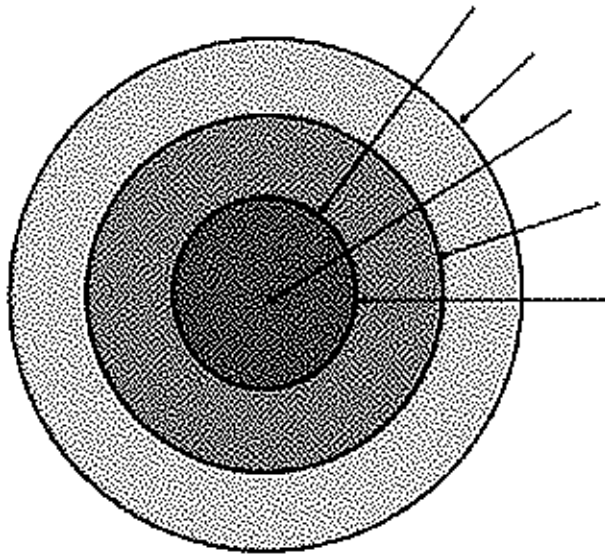
Biosecurity system in a slide (V. 2)



A Familiar Lens

- ▶ Pre-border
 - ▶ Establish, monitor risk mitigation
 - ▶ Anticipate risk changes
 - ▶ Expand border via partnerships
- ▶ Border
 - ▶ Environment scan
 - ▶ Warrant compliance
 - ▶ Intercept biosecurity risk material
 - ▶ Deter non-compliance

Biosecurity system in a slide (V. 2)



A Familiar Lens

- ▶ Pre-border
 - ▶ Establish, monitor risk mitigation
 - ▶ Anticipate risk changes
 - ▶ Expand border via partnerships
- ▶ Border
 - ▶ Environment scan
 - ▶ Warrant compliance
 - ▶ Intercept biosecurity risk material
 - ▶ Deter non-compliance
- ▶ Post-border
 - ▶ Monitor
 - ▶ Respond
 - ▶ Manage

And: invasive species respond differently to different layers

Why resisting can be enough: Fall armyworm



Arrival

- ▶ January 2020 FN Queensland
- ▶ September 2020 Northern New South Wales.
- ▶ December 2020 Victoria

Why resisting can be enough: Fall armyworm



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Response

- ▶ Insecticide cost \$1,000 a litre
- ▶ A\$14.2-39.3 million in WA

Why resisting can be enough: Fall armyworm



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Response

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- ▶ A\$14.2- 39.3 million in WA

Future

- ▶ Queensland DPI research since 2021
- ▶ Native pathogenic fungus *Nomuraea rileyi*
- ▶ Kills within 24 hours of exposure
- ▶ Resistance development very unlikely

Pathways: Means of transport of invasive species

Again, to fix ideas . . .

Human

- ▶ Things
- ▶ People
- ▶ Conveyences

Natural

- ▶ Wind
- ▶ Tide / rivers / floods



(<https://www.easyhaul.com/blog/2021/07/14/an-overview-of-modes-of-transport/>)

Which way is up?

The Ages of Biosecurity

Null --- do nothing, or even bring in invasive species (e.g., foxes, rabbits)

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- Systemic --- the border is mainly monitoring pre-border risk mitigation; consider the ROI of interventions across the system
- Social ---- the system comprises stakeholders and we should consider how they behave; incentives are real!
- Golden --- phone home when you get there ...!

An illustration of the Ages using sea containers

- ▶ Null ... no measures at all
- ▶ Biological ... IQI
- ▶ Statistical ... Country Action List
- ▶ Systemic ... SCHS
- ▶ Social ... Chain of custody (proposed)
- ▶ Golden ... an exercise for the reader ...



Pathways can be in different Ages

Data matters: some rank generalisations about our pathways

Things (Cargo / Mail)

- ▶ Commercial cargo has declarations, tariffs and history
- ▶ Non-comm. cargo and Mail has descriptions; history is patchy

Pathways can be in different Ages

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- ▶ Declarations almost always
- ▶ Some people have travel history
- ▶ Some cohorts have compliance patterns

Pathways can be in different Ages

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- ▶ Some cohorts have compliance patterns

Conveyances (Ships / Planes / Containers)

- ▶ Ships / planes have masters and owners, history, declarations
- ▶ Containers have hitchhikers

(Activity)

(Activity)

Think, Pair, Share

- ▶ Choose two pathways in your experience from Things / People / Conveyances. Feel free to be very specific, *e.g.*
 - ▶ Sea containers
 - ▶ Plant products
 - ▶ Product X from Country Y
- ▶ Identify which Age of Biosecurity they align with, and why
 - ▶ Null --- no measures
 - ▶ Biological --- try to stop all danger at the border
 - ▶ Statistical --- manage pathways differently at the border
 - ▶ Systemic --- systems approach
 - ▶ Social --- use incentives
 - ▶ Golden --- ...
- ▶ Discuss with your neighbour --- preferably not a colleague!

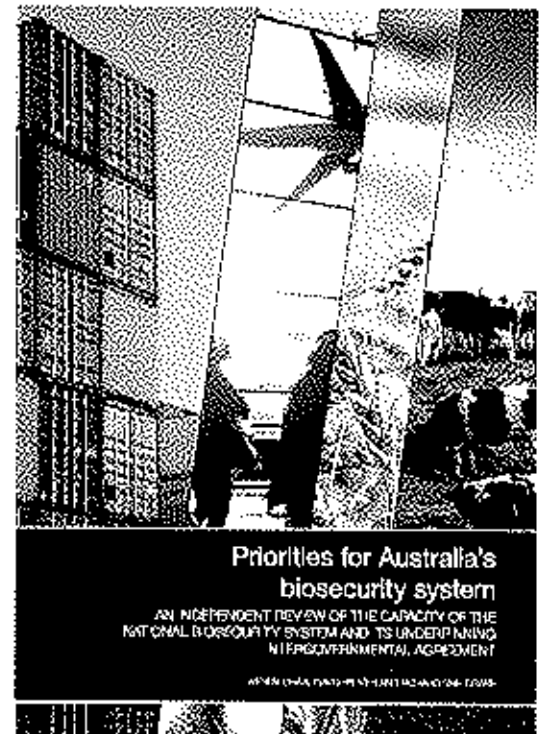
Why it matters

- ▶ Null — invasive species move around as they please
- ▶ Biological — some invasive species are stopped at border; better protection
- ▶ Statistical — more efficient stopping; needs information about the pathways
- ▶ Systemic — pre-border scales; border does not; more efficient than Statistical
- ▶ Social — social scales more efficiently still; pre-border *and* post-border
- ▶ Golden — ...

The border doesn't scale

Craik et al. (2017) IGAB review, Box 1

- ▶ RRRA model
- ▶ Project volume increases 2014/15 to 2025
- ▶ Pax, vessels, sea containers, and timber
- ▶ 2014/15: 90M → 2.4B/1.7B
- ▶ Three scenarios (assuming infrastructure!):
 - ▶ Retain: 90M → 2.4B/4.4B
 - ▶ Scale to volume: 153M → 3.8B/2.9B
 - ▶ Scale to residual: 250M → 4.7B/2.1B
- ▶ “This highlights the importance of seeking innovative approaches, pre-border and post-border as well as at the border, to biosecurity risk management; simply increasing funding is not a ‘silver bullet’.”
- ▶ We should update ;-)



... and how do we get there?

Moving into Ages

Null no measures

Moving into Ages

Null no measures

Biological lots of border (people and space)

Moving into Ages

Null no measures

Biological lots of border (people and space)

Statistical data, analysis, monitor, update, environment, but less border the risk is still managed at the border, but more efficiently

Moving into Ages

- Null no measures
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Moving into Ages

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Statistical data, analysis, monitor, update, environment, but less border ---- the risk is still managed at the border, but more efficiently

Systemic ...add in science, diplomacy, monitoring, but less border still ---- the risk is being pushed offshore and the border is mainly a check

Social ...add in behavioural economics ---- the risk is being dispersed

Golden ...need a miracle(!)

Moving into Ages: a caveat

Things aren't as straightforward as they seem ...consider the Statistical age

Implementation of risk-based decision architecture needs

- ▶ data,
- ▶ a way to use the data to identify risk,
- ▶ a way to implement risk-based intervention on the ground,
- ▶ a way to monitor the managed and residual risk,
- ▶ a way to update the system when things change, and
- ▶ a cultural expectation that data can be used this way.

Questions & Discussion

Thanks!

Points to ponder

1. Why do We inspect at the border?
2. Do our interventions scale with volume?
3. Can we skip Ages?
4. How do we cooperate better?
5. Why should we cooperate better?



<https://cebra.unimelb.edu.au>

<https://overview.cebra.unimelb.edu.au/research-output-searchable-database.html>



Compliance behaviour in biosecurity regulation

Implications for Pre-Border Biosecurity Treatments and Controls

May 2025

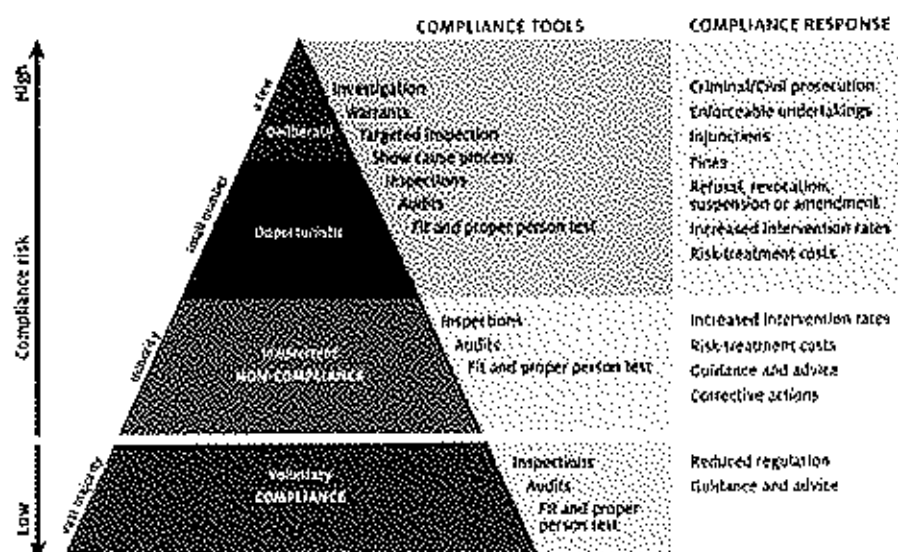
Morgan Slater – Department of Agriculture, Fisheries and Forestry
Compliance and Enforcement Division | Capability and Engagement



The Evolution of Biosecurity Regulation: Past, Present and Future

1. We have seen shifts in compliance trends across pre-border biosecurity treatments.
2. As a result, we continue to evolve our approach to regulation.
3. Compliance behaviours are driven by human decisions.
4. We can adapt our approach to regulation using insights from psychology and how we understand compliance behaviours.

Regulatory Compliance

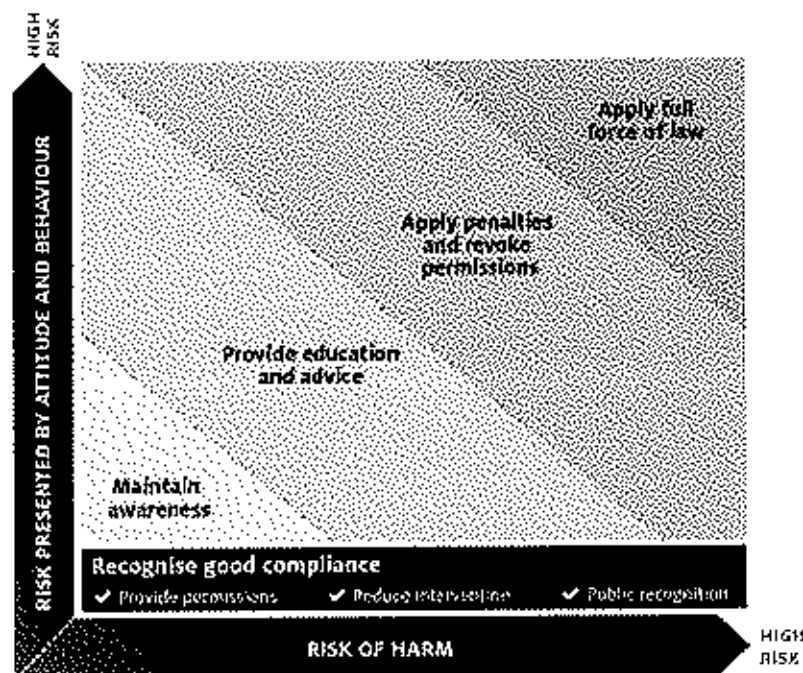


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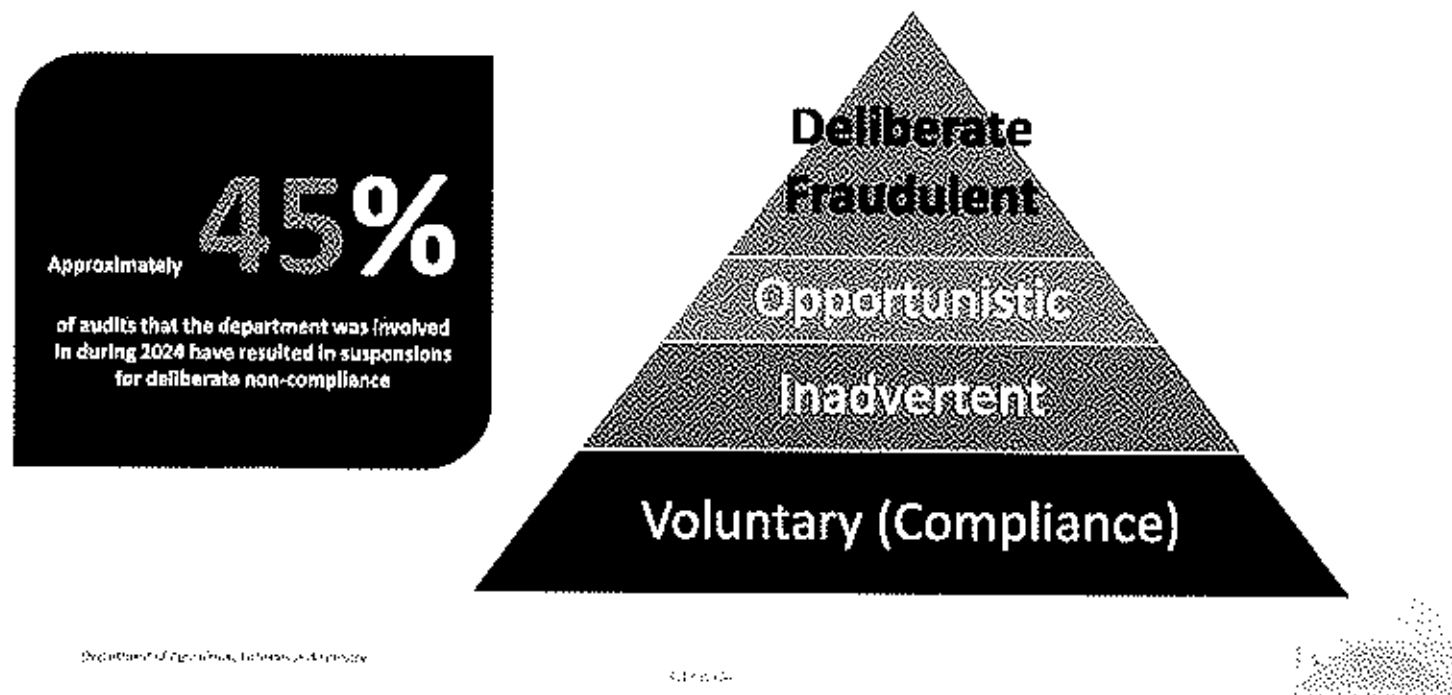
Responding to Non-compliance



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EN-10291

Inadvertent, Opportunistic and Deliberate Non-Compliance



Inadvertent, Opportunistic and Deliberate Non-Compliance

Inadvertent Non-Compliance	Opportunistic Non-Compliance	Deliberate Fraudulent Non-Compliance
<ul style="list-style-type: none"> Unintentional mistakes. Caused by Lack of awareness, poor training. Wants to comply but lacks skills, resources or knowledge 	<ul style="list-style-type: none"> Taking advantage of a situation. Motivated by short-term gain. Will take opportunities to take shortcuts 	<ul style="list-style-type: none"> Intentional rule breaking. Motivated by profit and competition Will deliberately work to avoid controls and regulation

Human Behaviour and Non-Compliance

In this section we will cover

1. Theories of human behaviour
2. How to apply theory to understanding non-compliance
3. How to promote compliance through controls and to identify motivators for non-compliance

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Psychology, Compliance, Regulation

What is Psychology?



Using Psychology to Support Regulation

To adapt to evolving compliance conditions, we can use human research to inform and support our regulatory actions.



There are many psychological principles and theories that we can leverage in our approach to regulation



These theories range from adjusting small details (colours, words, phrases) to large overarching theories of human behaviour (what motivates compliance)

Today we will focus on one theory as an example:

The Theory of Planned Behaviour

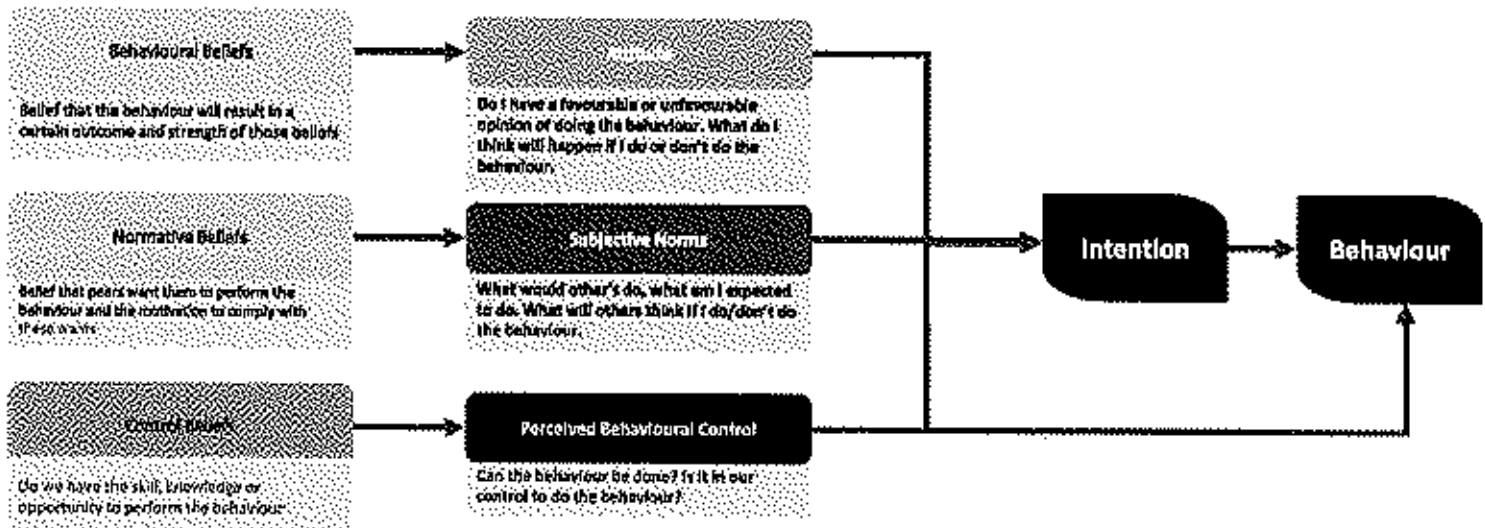
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Compliance Behaviours

Theory of Planned Behaviour

The theory of planned behaviour is an established model that has been used in a variety of contexts to predict behaviour. It predicts 20% of the variance in behaviours and is one of the most widely used models.



Alcan, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

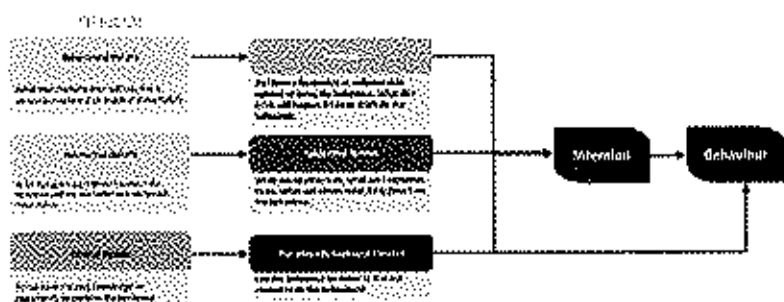
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Compliance Behaviours

Theory of Planned Behaviour

Let's step through a simple example, going for a run.....



Attitudinal Beliefs (Attitudinal Beliefs)

Is Running good or bad:

1. Very Bad
2. Bad
3. Good
4. Very Good

Is going for a run going to be:

1. Terrible
2. Bad
3. Good
4. Great

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Normative Beliefs (Normative Beliefs)

Does my partner/friend/family member expect or want me to go for a run

1. No - very much
2. No - somewhat
3. Yes - somewhat
4. Yes - very much

Do they expect me to do something else:

1. Yes - very much
2. Yes - somewhat
3. No - somewhat
4. No - very much

Will they think badly of me if I don't run

1. No - very much
2. No - somewhat
3. Yes - somewhat
4. Yes - very much

Department

Perceived Behavioral Control (Perceived Behavioral Control)

Do I have the energy/fitness/time to do it?

1. No - very much
2. No - somewhat
3. Yes - somewhat
4. Yes - very much

Do I have nothing else that I should be doing instead:

1. No - very much
2. No - somewhat
3. Yes - somewhat
4. Yes - very much

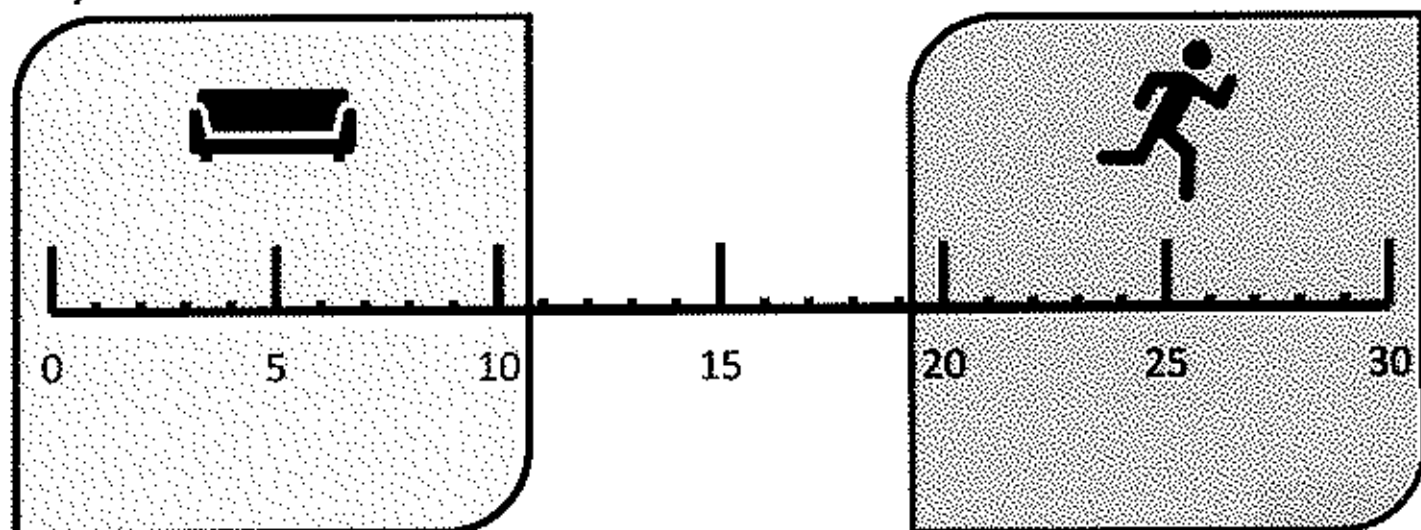
How hard is running going to be?

1. Very Hard
2. Hard
3. Easy
4. Very Easy

Page

Compliance Behaviours

Theory of Planned Behaviour

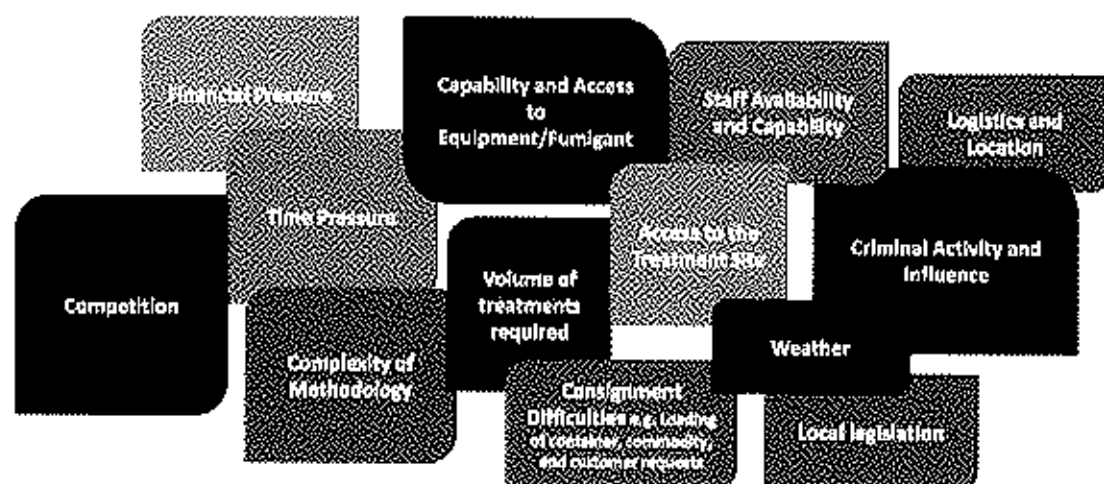


Department of Agriculture, Fisheries and Forestry

Department

Drivers of Compliance and Non-compliance

Environmental and Situational Factors



Department of Agriculture, Fisheries and Forestry

2017/2018

13

2017/2018

Theory of Planned Behaviour – In Regulation of Pre-Border Biosecurity Treatments

So, what does this mean? How do we apply it to understanding compliance behaviours? For us it means that treatment providers are likely asking themselves key questions when making decisions about compliance.

Perceived Attraction

- What's the likelihood of getting caught for non-compliance?
- If I get caught what is the consequence?
- Can I cut corners on the treatment?
- Can I falsify or mislead information on the records?
- Does it matter if the treatment isn't done/ or isn't effective?
- What's the likelihood of there being live pests?
- Is it worth my time/money/effort to comply?
- Is there value in complying?

Perceived Norms

- What does the company/boss/customer/importer want?
- What is expected of me as a treatment provider?
- What do other treatment providers do?
- Are the pests/target of treatment a real concern?
- Are my competitors complying/non-compliant?
- Who has authority over treatments?
- What are others doing in my situation?
- Do people think biosecurity is important?

Perceived Behavioural Control

- Am I able to meet the requirements?
- Am I able to conduct a compliant treatment?
- Does my company/boss/customer want me to conduct a compliant treatment OR do they want me to conduct a cheaper quicker treatment?
- Am I able to push back on pressures to engage in non-compliant practices?

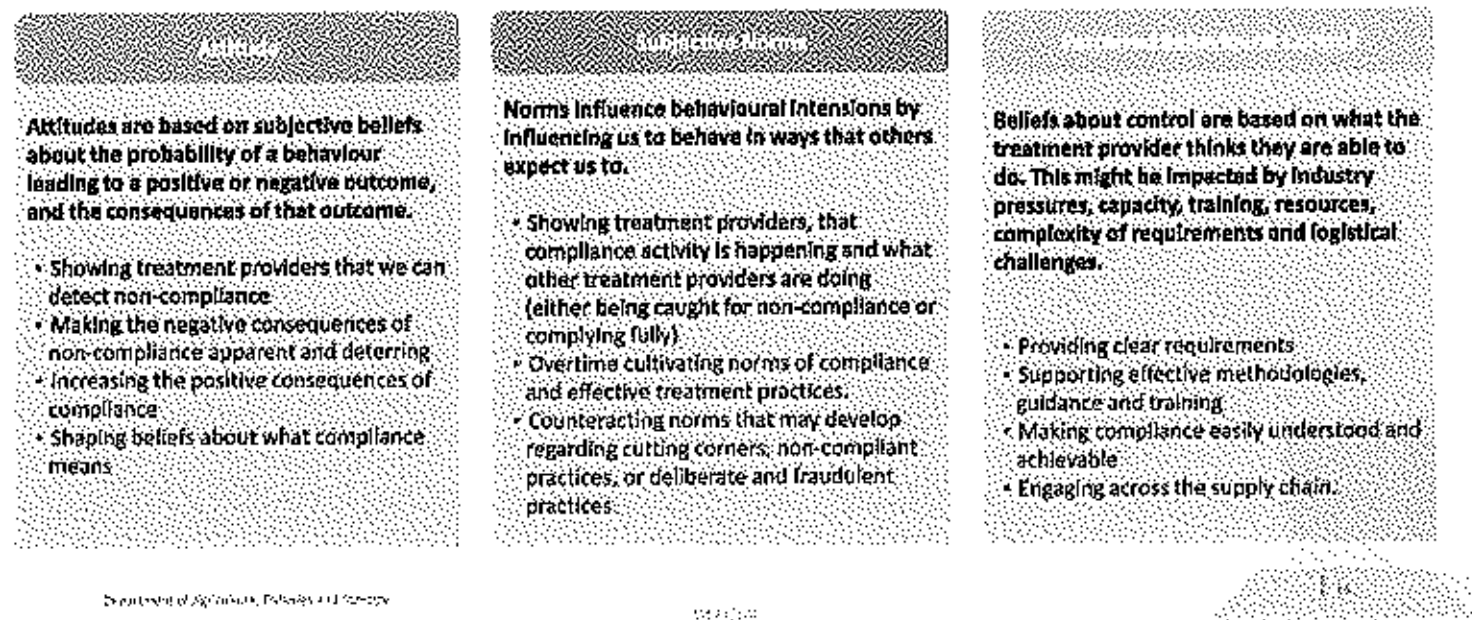
Department of Agriculture, Fisheries and Forestry

2017/2018

14

Theory of Planned Behaviour

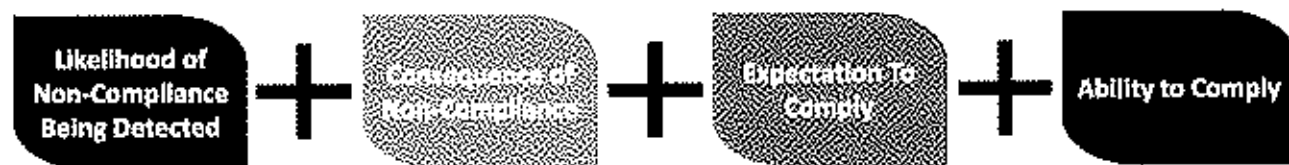
We can influence specific aspects to change attitudes towards compliance behaviours, expected social norms and perceptions of control.

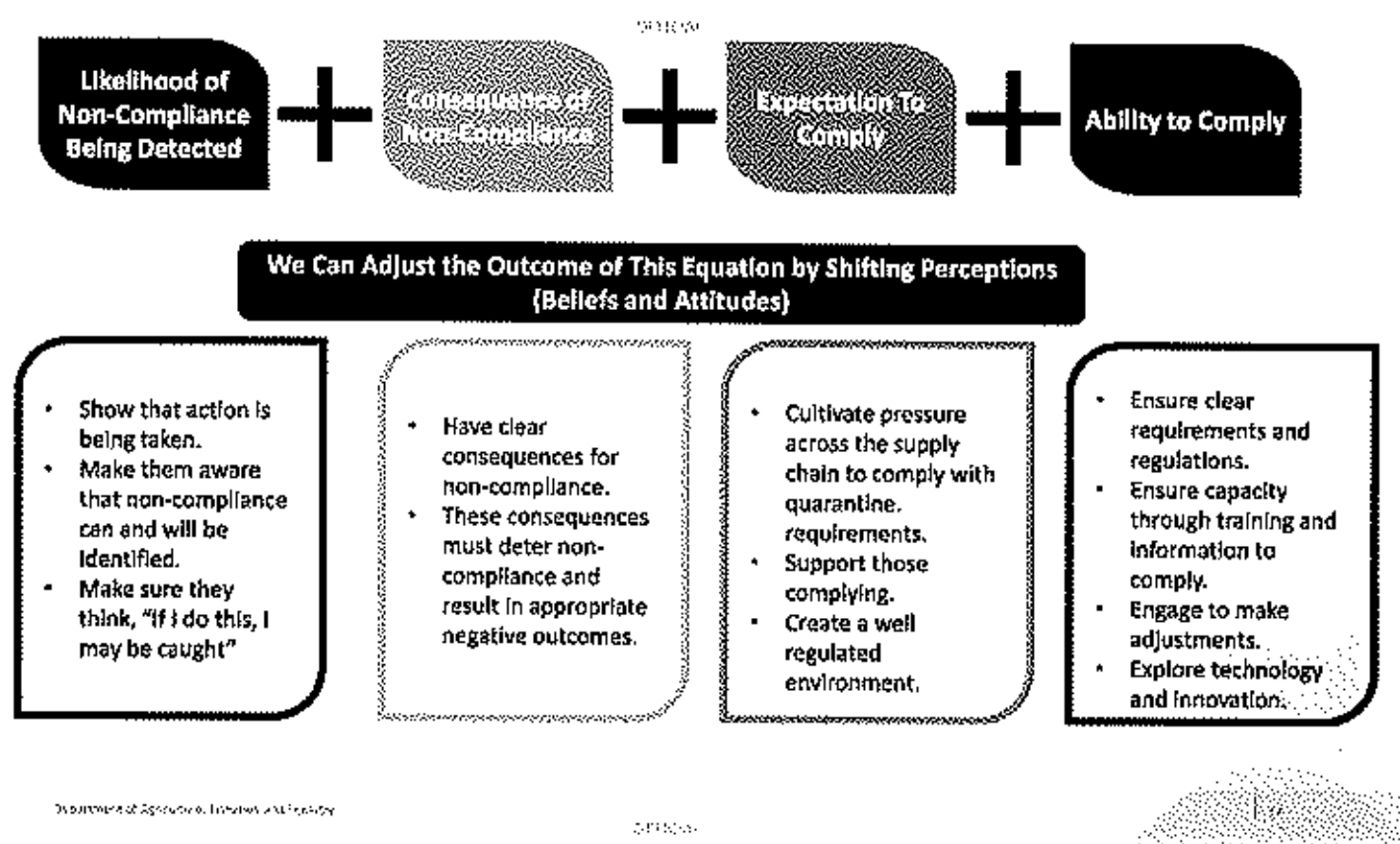


Compliance Behaviours – Putting it all together

Key Compliance Factors

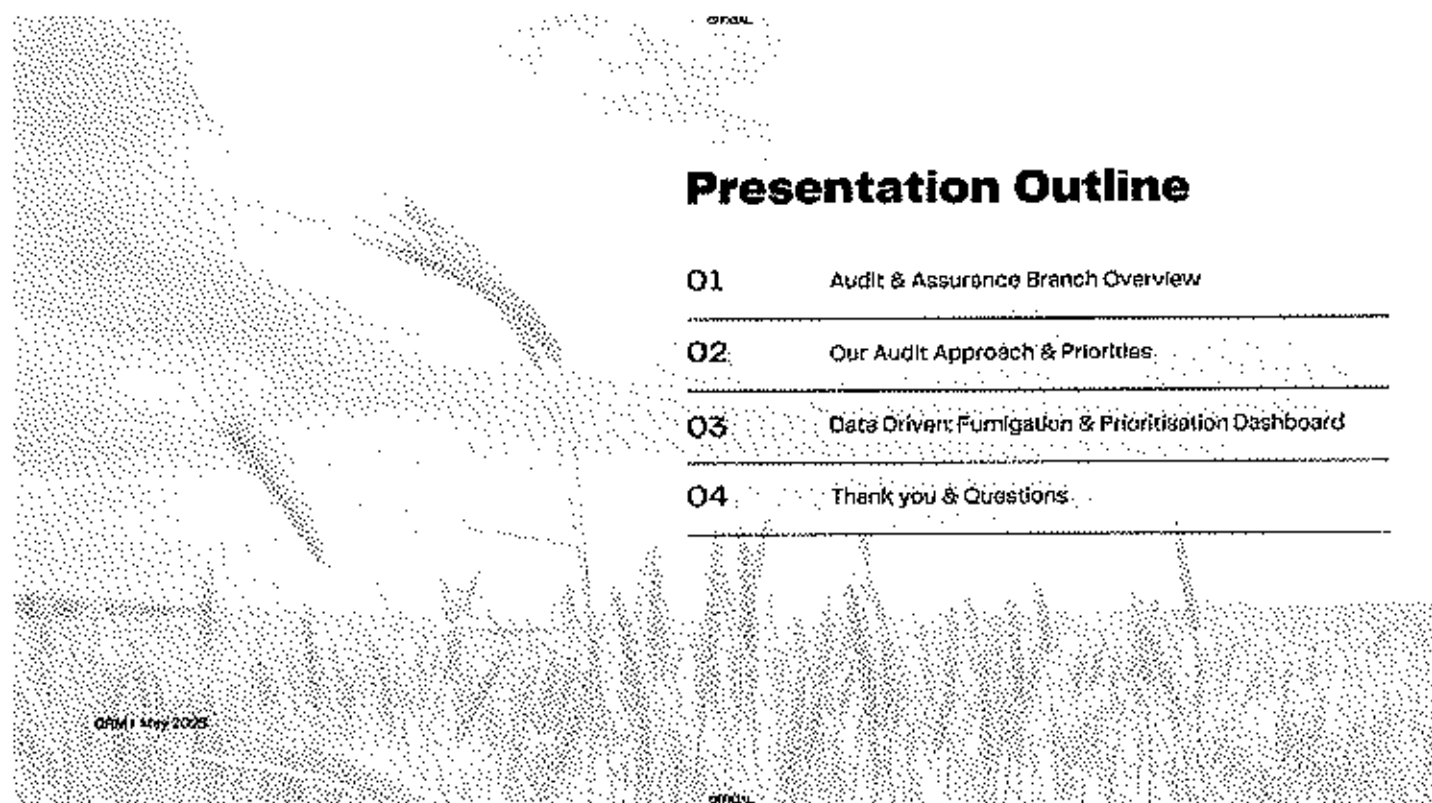
Based on the model we can extract some key compliance factors that can help us understand Treatment Provider compliance.





End of Presentation

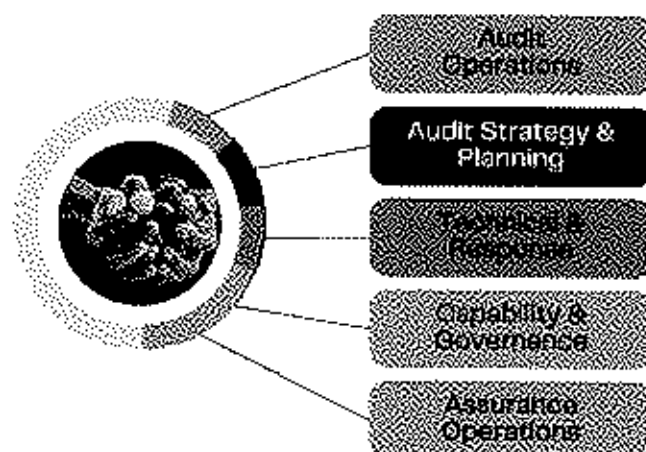
Thank you for your attention and participation.



Audit & Assurance Branch

Who are we?

- The Branch is part of the Compliance and Enforcement Division, within the Biosecurity and Compliance Group
- We have a national footprint with more than 91 staff which includes;
 - auditors
 - technical experts and mentors
 - client services
 - operational managers
 - business managers and
 - data analyst



QNM1 May 2026

21/04/24

21/04/24

Our Purpose

AAB is responsible for the effective and efficient delivery of regulatory audits and other activities to provide assurance in relation to the management of biosecurity and export risks.

- AAB is responsible for delivery of regulatory biosecurity and export audits
- Our auditor workforce conducts nationally integrated regulatory audits over;
 - Import Approved Arrangements
 - Export establishments
 - Other – including overseas audits
- Our Assurance Operations section performs regulatory assurance activities to provide confidence about how effectively and efficiently departmental systems, activities and measures are managing regulatory risks.



QNM1 May 2025

21/04/24

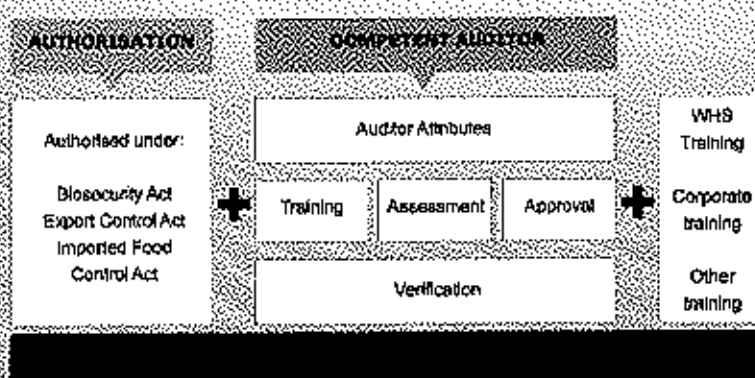
Auditor Management Framework

The Auditor Management Framework outlines the processes that Audit and Assurance branch uses to recruit, train, assess, approve and verify the performance of departmental auditors. The framework enables the branch to demonstrate how we ensure our auditors are competent in their role.

Overview of the Auditor Management Framework

To be an auditor for AAB staff need to be

- authorised under relevant legislation
- appropriately trained
- assessed as competent
- approved to conduct audits and
- verified as competent on an ongoing basis



Audit Operations

Who do we audit?

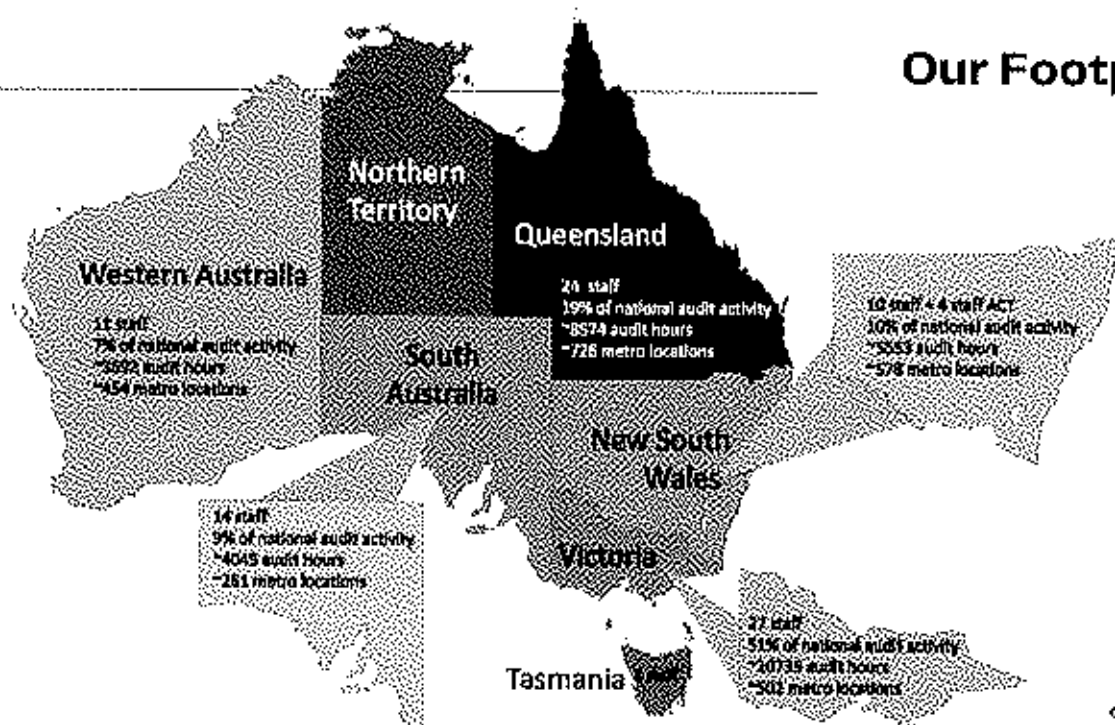
EXPORTS

- Export plant for example growers and pack houses
- Export Food for example meat processing and poultry slaughter establishments
- Live Animal Exports
- Fish, egg and dairy registered establishments and AA's
- Various animal by-product establishments including:
 - Blood harvest and processing facilities
 - Rendering establishments (to assist importing country reviews)
- Offshore fertiliser facilities

IMPORTS

- Import Approved Arrangements (AA's) for:
 - Cargo & Cargo Treatment
 - Biosecurity
 - Food Imports
 - Waste
 - Fumigation etc.

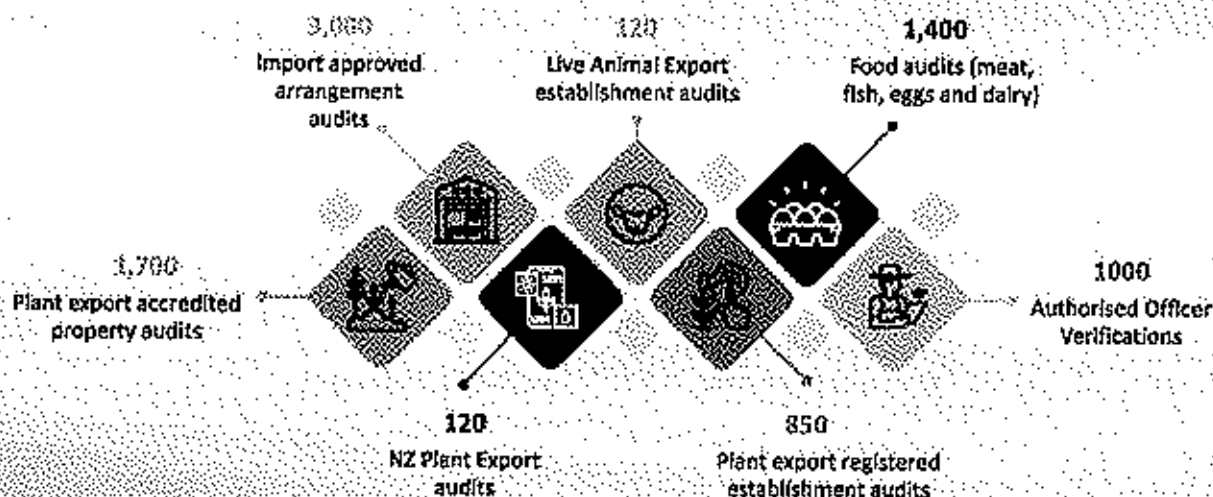
Our Footprint



QRM 1 May 2025

How many audits?

Our audit team conducts thousands of audits annually, last financial year, we conducted audits on the following registrations:



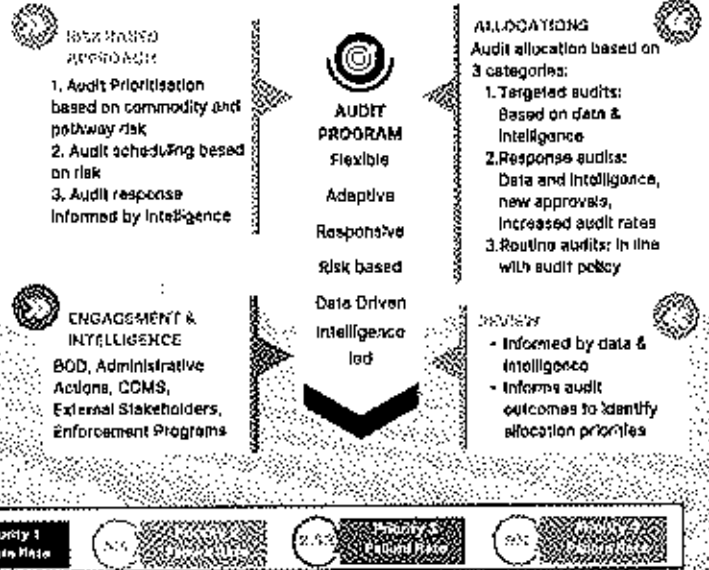
QRM 1 May 2025

Risk Based Approach

Background

- Priority ratings for audit scheduling introduced in 2019
- No comprehensive review of the priority ratings
- No process to incorporate commodity pathway & biosecurity risk into prioritisation
- The approach supports Commonwealth Biosecurity 2030
- Is aimed at improving regulatory efficiency, effectiveness and maturity

Risk Based Prioritisation



Remote, Announced & Unannounced Audits

Remote Audits

Total audits conducted

2199



Total Site Visits
1097

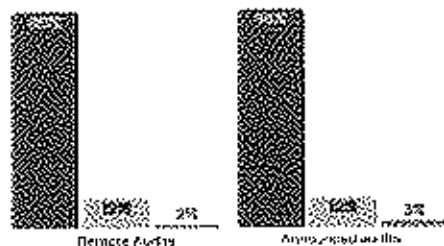


Total Remote Audits
1102

Remote Audit Outcomes

LEGEND

- Pass - No NC
- Pass - NC
- Fail

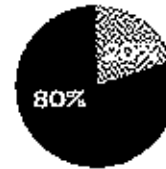


Date from September 2021

Announced/ Unannounced Audits

Total audits conducted

4027



Total Announced
3208

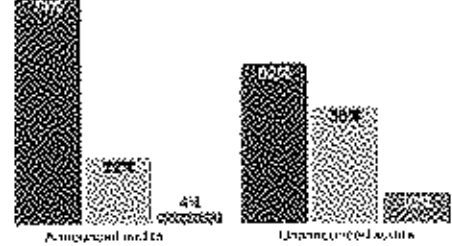


Total Unannounced
821

Announced / Unannounced Audit Outcomes

LEGEND

- Pass - No NC
- Pass - NC
- Fail



Date current from February 2024

Fumigation Dashboard

Report: Onshore Fumigation Treatment

Page: Fumigation volume

PURPOSE

- Provide visibility of onshore treatment data for Class 12 treatment providers.
- Enable Strategy and Workload to prioritise treatment provider auditors ensuring capture is within peak operating periods
- Enable further insights and reporting capabilities to be developed over time as data collection expands
- Enable auditors to identify trends and focus areas for audit activities

KEY ELEMENTS

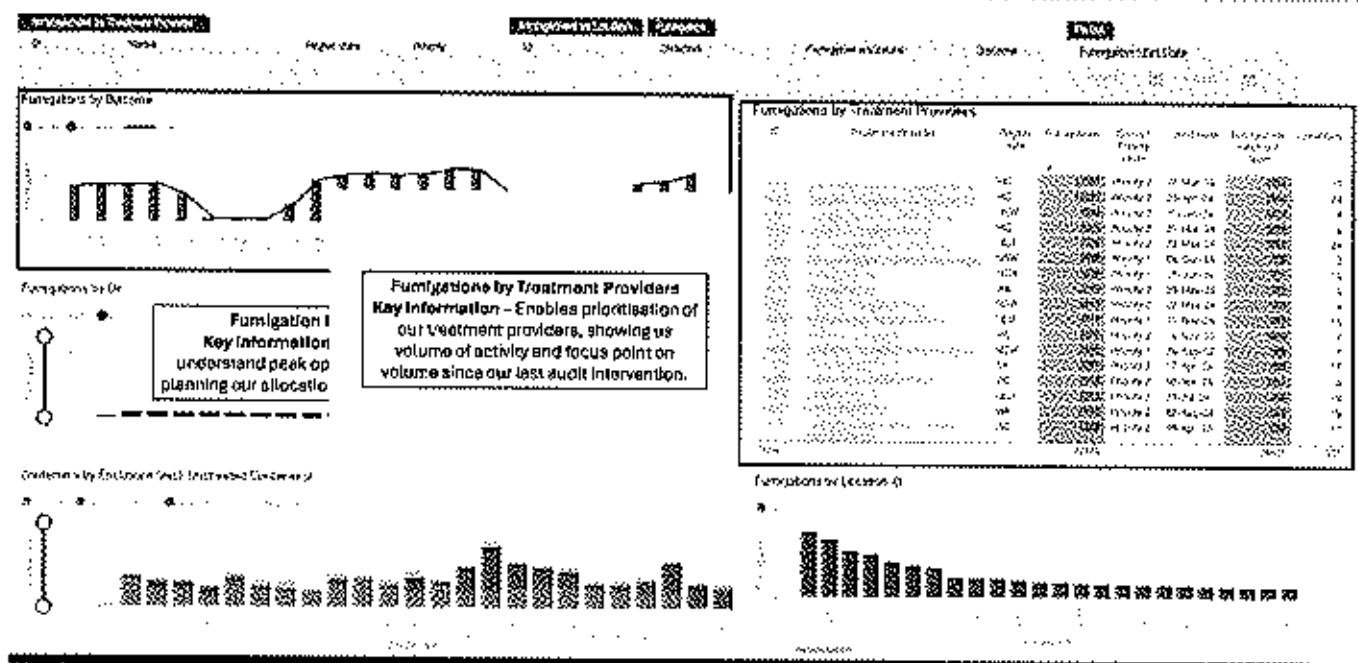
- Search function by ID, name, region, state, direction, fumigation date
- Fumigations by Treatment Provider
- Fumigations by Direction
- Fumigation Outcomes
- Fumigations by Location ID
- Containers by Enclosure

GRM May 2025

GRI 308

GRI 308

Fumigation Dashboard



Fumigation Dashboard

Report: Onshore Fumigation Treatment

Page: Fumigation Provider

PURPOSE

To provide insights into Approved Arrangement Treatment Providers and their activity for indicators and focus areas for audit review

KEY ELEMENTS

- Search function by ID, name, heaters, perishable, fumigation date
- Fumigations since last audit by day and gas in local time
- Fumigations since last audit
- Location States
- Fumigator names since last audit
- Fumigations Location since last audit by fumigator name
- Fumigations by Direction

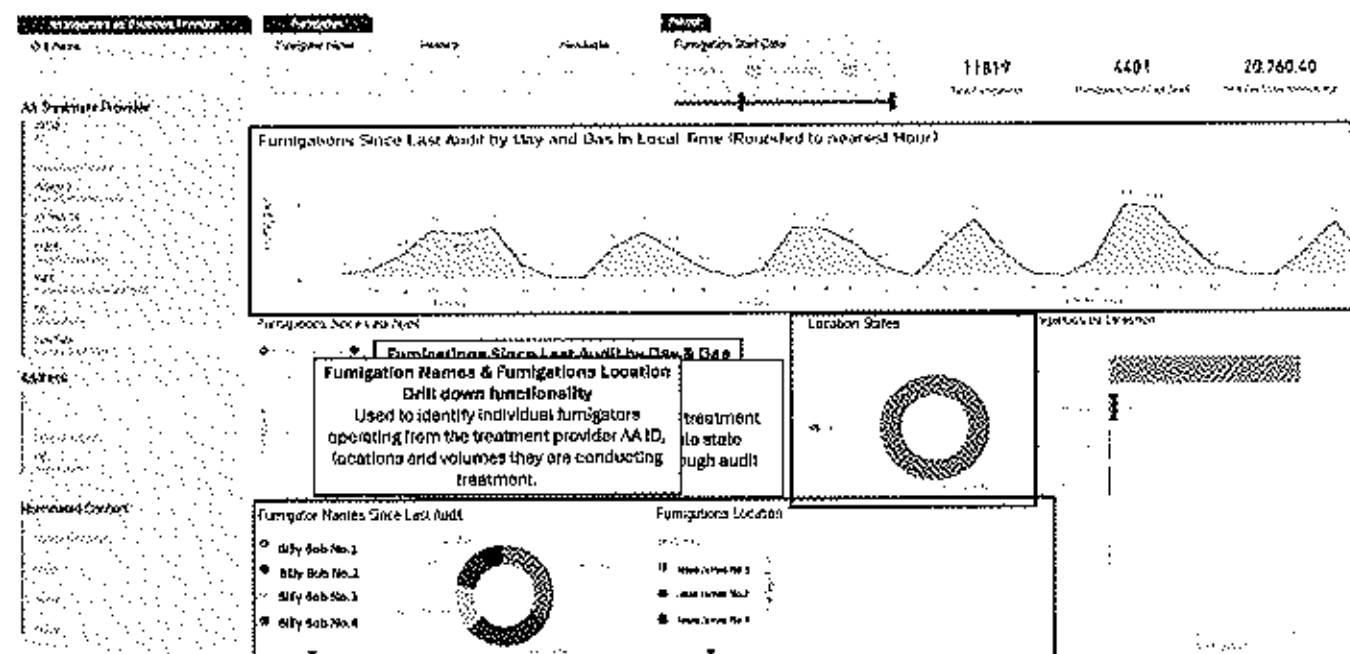


QRM 1 May 2025

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Fumigation Dashboard



Page: Entry Direction Volume

To view the quantity of biosecurity entries per Approved Arrangement ID since the last scheduled/probation audit and/or an adjustable search period

- Search function by arrangement ID, name, region state,
- Search function by direction ID, entry ID, status, category, intervention and period
- Entry by intervention
- Entry with direction count
- Approved Arrangement with No Direction
- Entry and audit (probation, scheduled, and pre approval) in last 3 years
- Entry by Direction category

E470344

Prioritisation Dashboard



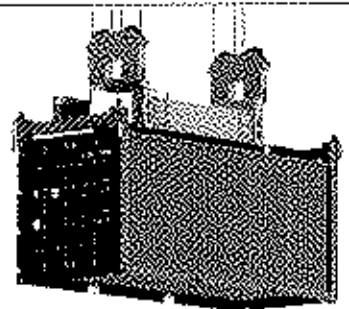
Prioritisation Dashboard

Report: AA Audit Prioritisation

Page: Non-Compliance History

CCMS

To view the quantity of CCMS non-compliance reports per Approved Arrangement ID since the last scheduled/probation audit and/or an adjustable search period

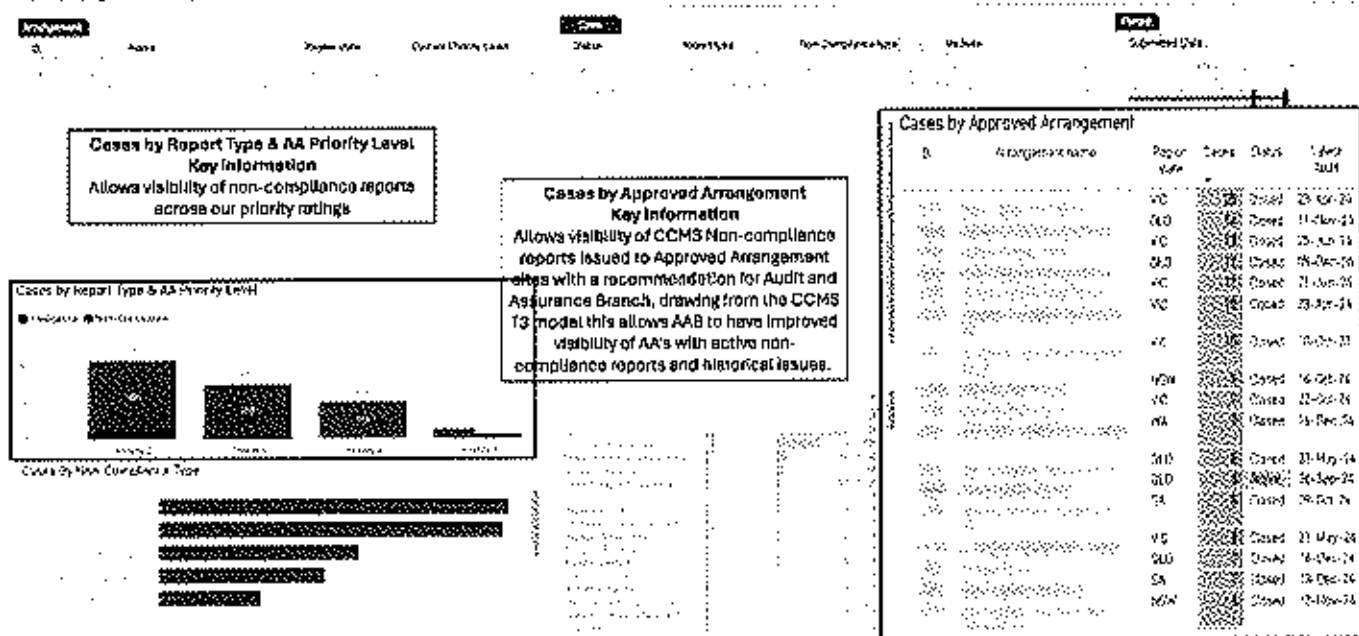


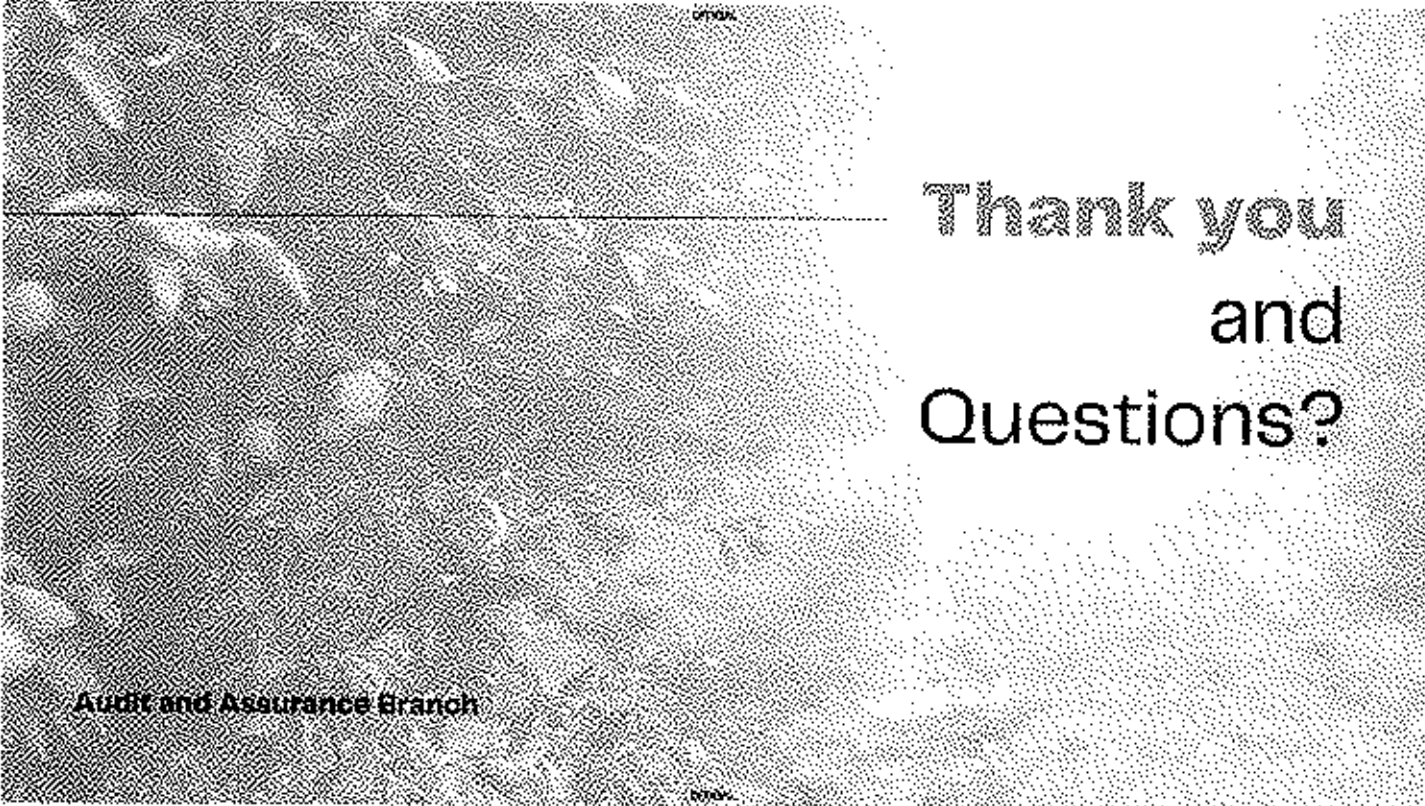
CCMS

- Search function by arrangement; ID, name, region state, current priority level and period
- Search function by case status; report type, non-compliance type and attribute
- Cases by Approved Arrangement and status
- Cases by Report Type and AA Priority Level
- Cases by Non-Compliance Type
- Cases by Attribute
- Cases by Action taken

CRM May 2025

Prioritisation Dashboard





**Thank you
and
Questions?**

Audit and Assurance Branch

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Australian Government
Department of Agriculture,
Fisheries and Forestry

Digitising Trade – A Paperless Evolution

Matt Moore

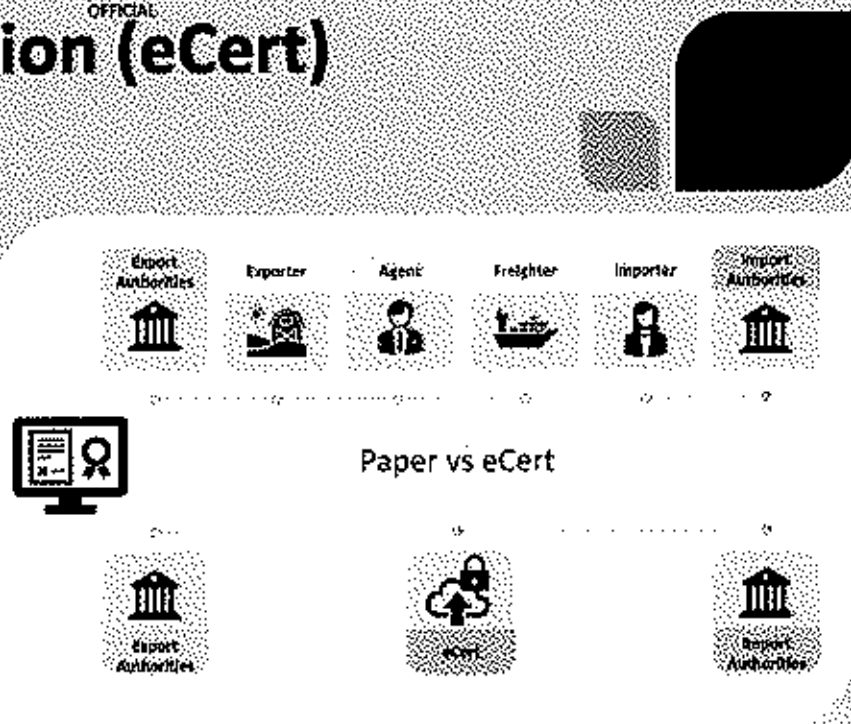
Director | eCert & Micoor



Electronic Certification (eCert)

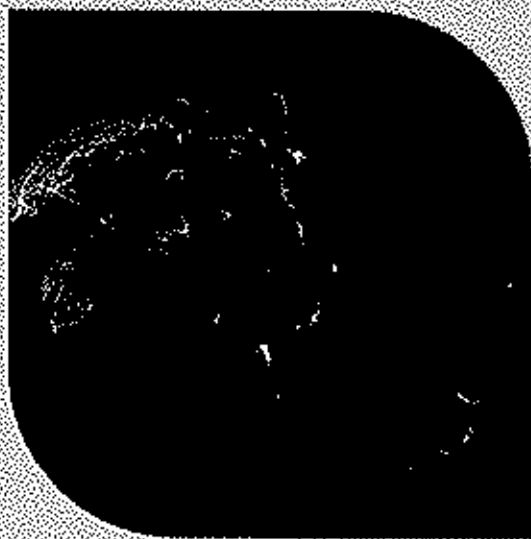
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- eCert is the secure electronic data transmission of SPS certificates
- eCert expansion is ongoing in both bilateral and multilateral forums
 - Objective is paperless certification
- Streamline the certification process for the Government and Business
- Supports the use of technology in other areas of border clearance



Progress

- Australia is growing in the ePhyto
- New guidance has been developed
- More guidance under construction
- Both government and industry are wanting to digitise more
- Interest is higher than ever



Guidance and Standards

The Codex Alimentarius
Commission (Codex)



Food and Agriculture
Organization of the
United Nations



World Organisation
for Animal Health
Founded as OIE

World Organisation for Animal
Health (WOAH)

International Plant
Protection Convention (IPPC)



International
Plant Protection
Convention



World Trade
Organization (WTO)

STDF

Standards and Trade
Development Facility (STDF)



OECD

The Organisation for Economic
Co-operation and
Development (OECD)

The United Nations Centre for
Trade Facilitation and Electronic
Business (UN/CEFACT)



UNECE
UN/CEFACT

Digital Everything!

Can we make everything digital?

Pressure to
remove paper is
increasing



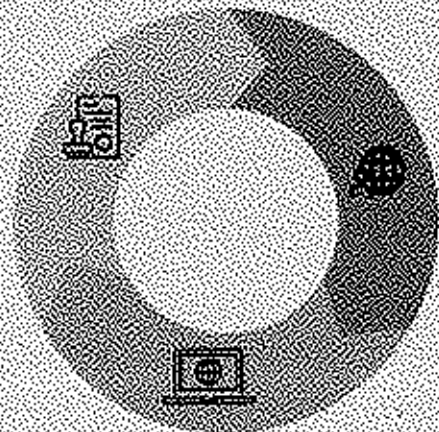
Discussion on
different kinds of
digital solutions

The speed and
value of these
possible options
are unknown



What do we do?

- There is a lot of discussion and a lot of opportunity
- Focus the guidance and standards that are there
- Try to engage in the new ones that are being developed
- Moving to digital doesn't mean changing requirements
- Have a back up plan
- Plan within or agencies and use your regional networks
- Linkages to other systems
 - Single trade windows
 - Domestic systems



The image is a collage with a dark, textured background. At the top, there's a large, stylized number '10' in a light, grainy font. Below it, the words 'Thank You' are written in a clean, white, sans-serif font. The bottom half of the image features a horizontal strip of various elements, including more instances of the number '10', some of which are integrated into a grid-like pattern, and other abstract, glowing shapes that suggest a digital or technological theme.

Thank You

The Evolution of Biosecurity Regulation in the Solomon Islands

Strengthening Biosecurity for National and
Regional Resilience

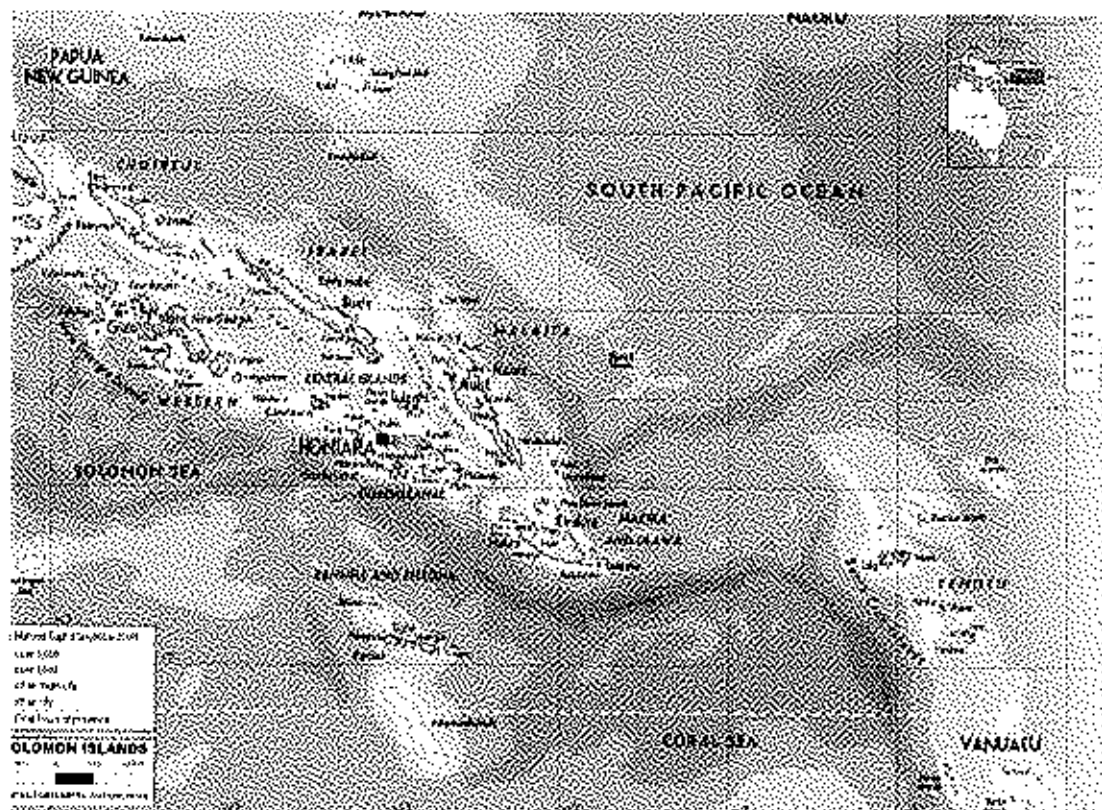
Ms Jean Erda
Director Biosecurity Solomon Islands



Outline

- **Purpose:** To provide an overview of the development of biosecurity regulation in the Solomon Islands and highlight key milestones, reforms, and future priorities
- **Where is the Solomon Islands?**
- **Early approaches to biosecurity**
- **The Agricultural Quarantine Act (1982)**
- **Drivers for reform**
- **Biosecurity Act (2013)**
- **Institutional Strengthening**
- **Achievements**
- **Regional and International alignment**
- **Challenge and opportunities**
- **Road ahead – next steps**
- **Conclusion**





Solomon Islands in context

- Solomon Islands has 6 major islands with over 1000 small islands
- Solomon Islands is divided into 9 main island groups - Provinces
- Total area of 28,896 square kms
- Population is around 734,887
- Very rich in culture
- We use around 70 to 120 distinct languages and dialects across the Islands
- To the west side, we are very close to Bougainville
- To the south, we are very close to Vanuatu



Early approaches to biosecurity

- **Pre-Independence and early post-Independence era**
 - Biosecurity functions embedded within broader agriculture/quarantine services
 - Limited legislation and institutional capacity
 - Reactive, rather than proactive approach

The Agricultural Quarantine Act (1982)

- **Legacy Legislation**
 - Primary legislative framework for plant and animal quarantine
 - Focused on preventing the introduction of pests and diseases, border inspection and pest control, etc
- **Limitations**
 - Outdated definitions and narrow scope
 - Needed to be updated to reflect the changing risk landscape and challenges



• Drivers for reform

- Increasing trade, tourism, and connectivity
- Regional/International obligations (e.g. IPPC, OIE, SPS Agreement)
- Climate change impacts and disaster-related pest incursions
- Need for a more coordinated, risk-based system
- Emerging threats: African Swine Fever, Coconut phytoplasma, Avian Influenza, etc
- Current issues: Coconut Rhinoceros Beetle, Giant African Snail, Varroa mite, Asian Subterranean Termite (AST), etc

• Biosecurity Act (2013)

- Modern legislation to replace the Quarantine Act
- Introduced new concepts
 - Pest risk analysis (PRA)
 - Import risk assessments (IRA)
 - Emergency response powers
 - National Biosecurity Committee
- Strengthened penalties and compliance tools



• Institutional Strengthening

- Establishment of Biosecurity Solomon Islands (BSI) under MAL
- Creation of specialised units: plant health, risk analysis, diagnostics, surveillance, compliance
- Improved coordination with:
 - Customs, Police, Ports, Aviation
 - Provincial governments and community-based monitors
- Capacity building support from the Australian Government through DFAT, DAFF and regional programs (e.g. PHAMA Plus, FAO, SPC, PACER Plus, etc)

• Achievements

- Improved diagnostics and surveillance systems
- Delivered several plant and animal health surveillance exercises in the Provinces
- Rapid response to invasive pests (e.g., CRB, Varroa mite, AST, and GAS programs)
- Development of Pest Risk Analyses and Import Conditions
- Training of staff on border operations
- Public awareness campaigns
- Electronic certification (ePhyto, working towards single window system with Customs – Asycuda)
- Effective delivery of biosecurity services during the Pacific Games of 2023



Regional and international alignment

- Active participation in:
 - Pacific Plant Protection Organisation (PPPO)
 - IPPC forums
 - PACER Plus and relevant Trade forums
- Trade facilitation through compliance with market access requirements
- Collaboration with Australia, New Zealand,

Challenge and opportunities

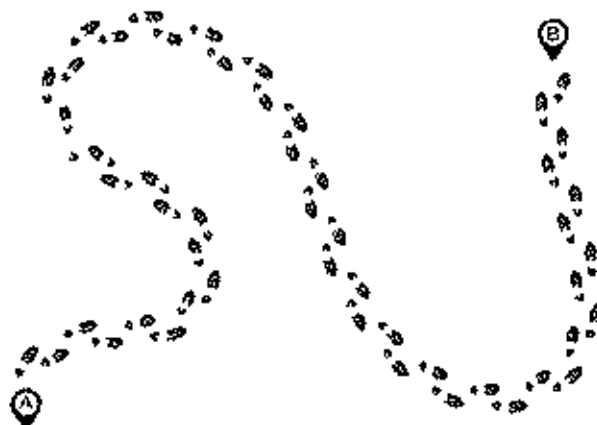
- **Challenges:**
 - Limited staffing and resources
 - Enforcement gaps at the provincial level
 - High-risk entry points (e.g. outer islands, unregulated ports)
- **Opportunities:**
 - Digitisation and e-certification
 - Regional surveillance networks
 - Integrating climate change and One Health
 - Stronger public-private-community partnerships

Where to next (Next steps)

- Finalisation of Biosecurity Regulations under the 2013 Act
- Review of the Biosecurity Strategy and Action Plan
- Mainstreaming biosecurity into national development and food systems policy
- Capacity building and leadership development
- Enhanced coordination across government, NGOs, and communities

Conclusion

- Biosecurity in Solomon Islands has evolved from basic quarantine to a more modern, risk-based system
- Ongoing investment and collaboration are essential to safeguard agriculture, health, and the environment
- Let's continue to work together to build a resilient and future-ready biosecurity system



Acknowledgements

- **Tenkyu tumas**
 - Support from the Australian government through DFAT and DAFF to attend this forum
 - Technical assistance provided to the Biosecurity Solomon Islands through the SI Biosecurity Development Program – funded by DFAT and implemented by DAFF
 - Collaboration with PNG and near neighbors in the Pacific – our Pacific family

Finally -

- I invite you all to visit the Solomon Islands!
- We are known as the Hapi Isles of the Pacific region!
- We have the best dive sites, beautiful weather all year, loads of fish, fruits and vegetables – we have the best pineapples if you're looking, and the friendliest people!



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Australian Government
Department of Agriculture,
Fisheries and Forestry

The future of biosecurity fumigation monitoring

Quarantine Regulators Meeting

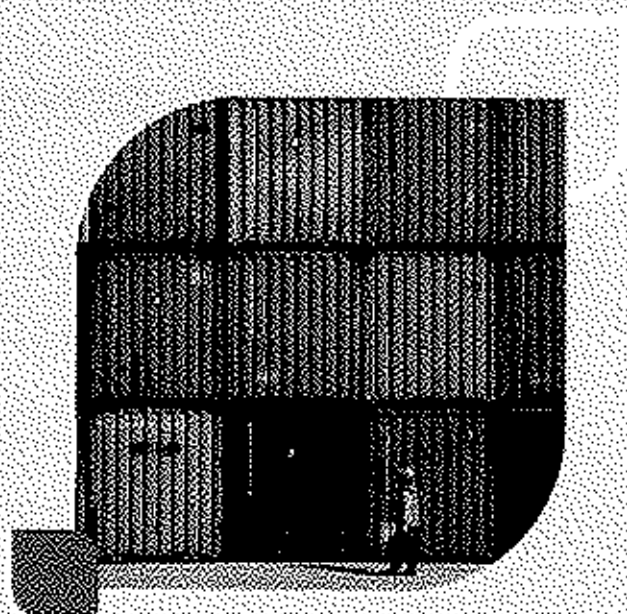
1 May 2025

Nicole Begg

Compliance Partnerships/Compliance and Enforcement
Division

Department of Agriculture, Fisheries and Forestry

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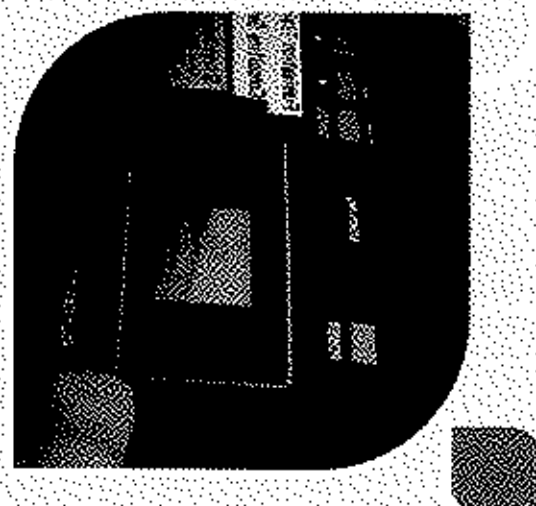
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The current situation

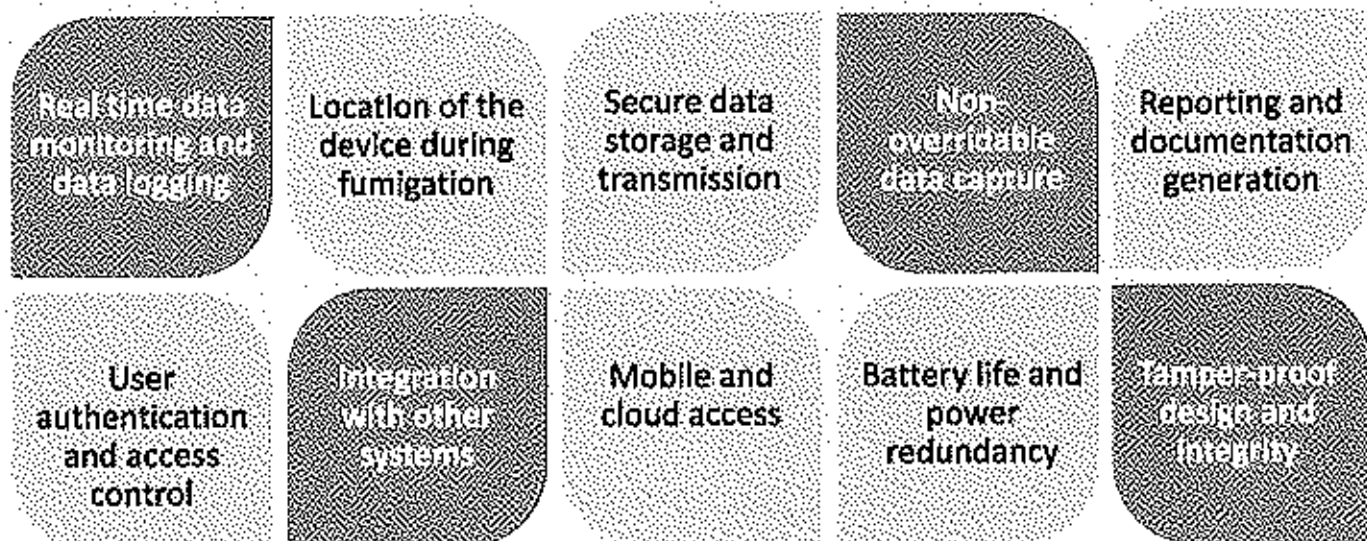
There is a pressing need for improved technology to proactively monitor, validate and report fumigation information.

Department of Agriculture, Fisheries and Forestry

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Minimum device capabilities



Opportunities for regulators

- Enhanced accuracy and reliability of fumigation data
- Reduced risk of fraud
- Enhanced compliance
- Reduce resource impost of current compliance assessment processes
- Proactively address non-compliance
- Allow more targeted compliance interventions
- More secure trade practices
- Minimised supply chain disruptions

Opportunities for industry

- Enhanced accuracy and reliability
- Minimised liability and risk of non-compliance
- Improved operational efficiency (fumigation set ups and reduced treatment failures)
- Stronger confidence from customers and regulatory authorities
- Better fumigation documentation and traceability
- Competitive advantage
- Improved regulatory compliance and audit readiness
- Enhanced efficiency and predictability of the logistics chain, ensuring smoother, faster processing of shipments
- More secure trade practices
- Minimised disruptions

What do we need to know?

1. Are there features of devices that you believe would be useful and provide additional assurance?
2. Are you aware of devices that currently exist or are in development that satisfy all, or some, of the features outlined today?
3. What do you consider are the significant drawbacks, if any, of using technology that satisfies the above features?
4. What is an acceptable timeframe for mandating this change? 3 years, 5 years, 10 years?
5. Is there anything regulators can do to incentivise voluntary uptake of this technology prior to it becoming mandatory? Reduced intervention at the border? Reduced audit frequency? A public facing system for treatment providers where providers that use this technology are promoted?

Any questions?

offshoretreatments@aff.gov.au



INDONESIAN
QUARANTINE
AUTHORITY

IQA Monitoring Application (Fumi-Trust) for Methyl Bromide and Phosphine Fumigation

Presented for QRM Manila, 2025

By Ratih Rahayu
Directorate Plant Quarantine Measures
Indonesian Quarantine Authority (IQA)

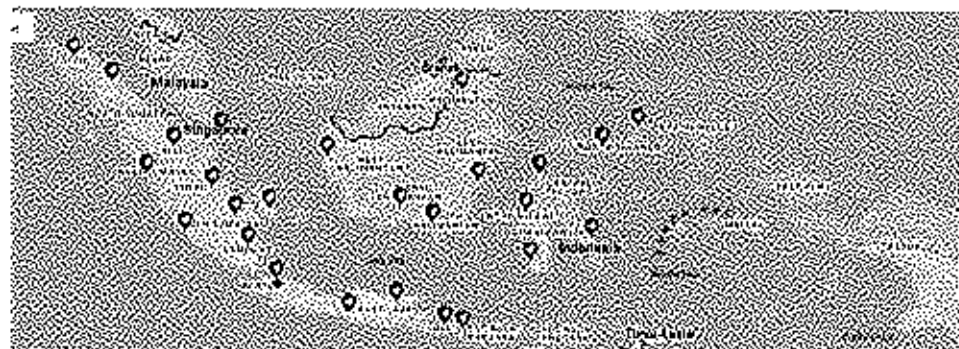
Badan Karantina Indonesia | karantinaindonesia.go.id



INDONESIAN
QUARANTINE
AUTHORITY

Overview

- Indonesia has been managing AFAS MB fumigation providers for more than 20 years, followed by PH3 fumigation providers
- As of March 2025, there are 89 treatment providers for MB and 91 for PH3
- Non-conformities are still frequently identified during audits (data manipulation, poor management of documents)



Badan Karantina Indonesia | karantinaindonesia.go.id



Why do we develop Fumi-Trust?

- ❖ To mitigate ineffective fumigation
- ❖ Management of documents for traceability
- ❖ IQA Legislation states quarantine treatment can be undertaken by third parties (IQA registered treatment providers) under the supervision of plant quarantine officers
- ❖ On-site monitoring requires additional time, cost, and sufficient human resources.
- ❖ Uniformity of fumigation monitoring applications in all quarantine stations

What is Fumi-Trust?

- ❖ Application for monitoring fumigation treatment conducted by other parties (IQA registered treatment providers)
- ❖ Developed by IQA officers, using Google platform
- ❖ Scope of application for Methyl Bromide and Phosphine fumigation to export, import, and domestic activities in related to plant quarantine matters
- ❖ Basic data through uploading information and photos in real-time
- ❖ Users and data utilization by treatment providers, IQA Quarantine Services, and IQA Headquarters



What are the benefits of Fumi-Trust?

Treatment Providers	IQA Quarantine Services	IQA Headquarters
<ul style="list-style-type: none"> Increasing confidence and trust in the performance of fumigations according to the standards Documentation is managed and traceable 	<ul style="list-style-type: none"> Solving the problem of limited time, cost, and human resources for in-person monitoring. 	<ul style="list-style-type: none"> The availability of accurate, fast, and easy data and information for policy consideration.



FLOW OF ACTIVITIES



Treatment Provider



IQA Quarantine Services



The fumigators



Fumigation companies,
IQA Quarantine
Services and IQA
Headquarters

Fumi-Trust output:

- Fumigation record sheet
- Photos (pre-fumigation, monitoring, post-fumigation)
- Monthly recap of fumigation
- Phase of ongoing fumigation
- Total amount of fumigant applied
- Map of daily fumigation activities of providers

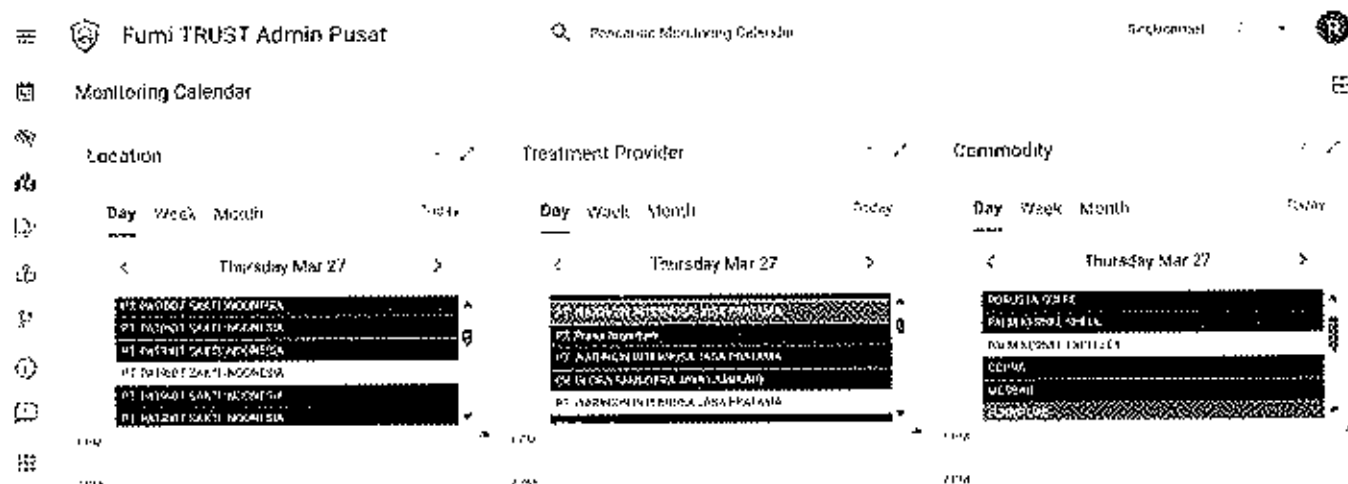


How to use the application



- ❖ Register the User Email to Admin
- ❖ Access app using google account that has been registered by admin

Monitoring of Fumigation Activities



- Monitoring place of fumigation, Treatment Providers, and Commodities
- Daily, weekly, and monthly



INDONESIAN
QUARANTINE
AUTHORITY

Fumigation Monitoring

Incursing Fumigation

Fumigan

Air Data

Methyl Bromide (CH₃Br)

Mappanosa (PHS)



Fumigation Monitoring



Methyl Bromide (CH₃Br)



ID Monitor

Status Pelaksanaan

Jasa Perumigan



1. LINDIDAO

Finalisasi

PT. ARMANDA NUSANTARA INDONESIA



2. AFASDEED

Selasa

PT. ARMANDA NUSANTARA INDONESIA



3. AAFEEJAD

Selasa

PT. SIKAP JAYA BERKAS



4. AFRODIDF

Selasa

PT. ARMANDA NUSANTARA INDONESIA



5. POFGEIFFA

Finalisasi

CV. KARYA HUGRAHA OMATA



6. GJEDFMH

Finalisasi

PT. SIKAP JAYA BERKAS



7. DABDCHDE

Selasa

PT. ARMANDA NUSANTARA INDONESIA



8. DABDCHDA

Selasa

PT. KARYA HUGRAHA OMATA



9. HJCBDDDF

Finalisasi

PT. SIKAP JAYA BERKAS

Konfirmasi Selanjutnya

Selasa

Revisi Perumigan

PT. ARMANDA NUSANTARA INDONESIA

Request Response

ID0091MD

Fumigan

Methyl Bromide (CH₃Br)

Tempat Tempat Perumigan

PT. JANGKAR PASIFIK

Jenis Ruang Perumigan

Sheeted Container

tgl. Mulai Perumigan

3/27/2025

Consignment Countries

Yes

Calatung



Badan Karantina Indonesia | karantinaindonesia.go.id



INDONESIAN
QUARANTINE
AUTHORITY



Fumi-TRUST Admin Pusat



Fumigation Monitoring / DABDCHDE



Monitoring / 2



Foto Kegiatan Fumigasi /



Foto

1. Foto sebelum fumigasi

2. Foto saat fumigasi berlangsung

3. Foto setelah fumigasi selesai

4. Foto setelah fumigasi selesai

5. Foto setelah fumigasi selesai

6. Foto setelah fumigasi selesai

7. Foto setelah fumigasi selesai

8. Foto setelah fumigasi selesai

9. Foto setelah fumigasi selesai

Pre-fumigation
photos



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Post - fumigation

Puml TRUST Admin Pusat

Fumigation Monitoring > DANBOCANG

Pencatatan Proses Aerasi

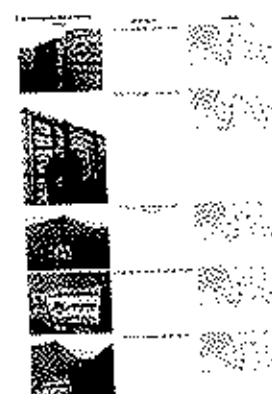
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3	Unit 3	Room 3	Room 3	Room 3	Room 3	Room 3
4	Unit 4	Room 4	Room 4	Room 4	Room 4	Room 4
5	Unit 5	Room 5	Room 5	Room 5	Room 5	Room 5
6	Unit 6	Room 6	Room 6	Room 6	Room 6	Room 6
7	Unit 7	Room 7	Room 7	Room 7	Room 7	Room 7
8	Unit 8	Room 8	Room 8	Room 8	Room 8	Room 8

Fumigation Monitoring > DANBOCANG

Data TLV

No	Room	Room No	Room Name	Room No	Room Name
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6	Unit 6	Room 6	Room 6	Room 6	Room 6
7	Unit 7	Room 7	Room 7	Room 7	Room 7
8	Unit 8	Room 8	Room 8	Room 8	Room 8

Fumigation record sheet



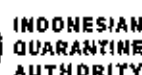
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7	Unit 7	Room 7	Room 7	Room 7	Room 7
8	Unit 8	Room 8	Room 8	Room 8	Room 8



Monthly recaps

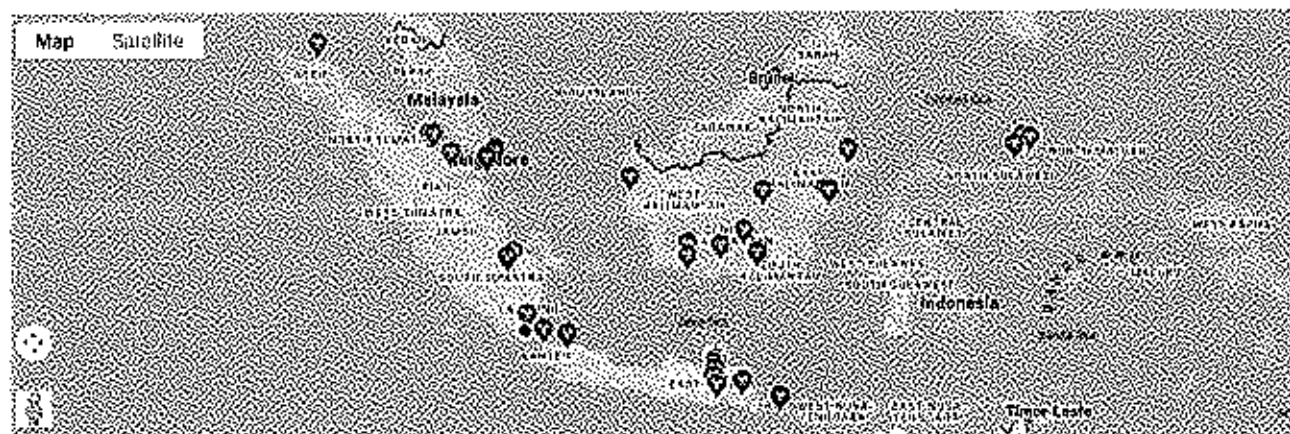
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 Badan_Karantina_Indonesia@KementerianIndonesia.go.id



Map of daily fumigation activities of providers

Insight Map

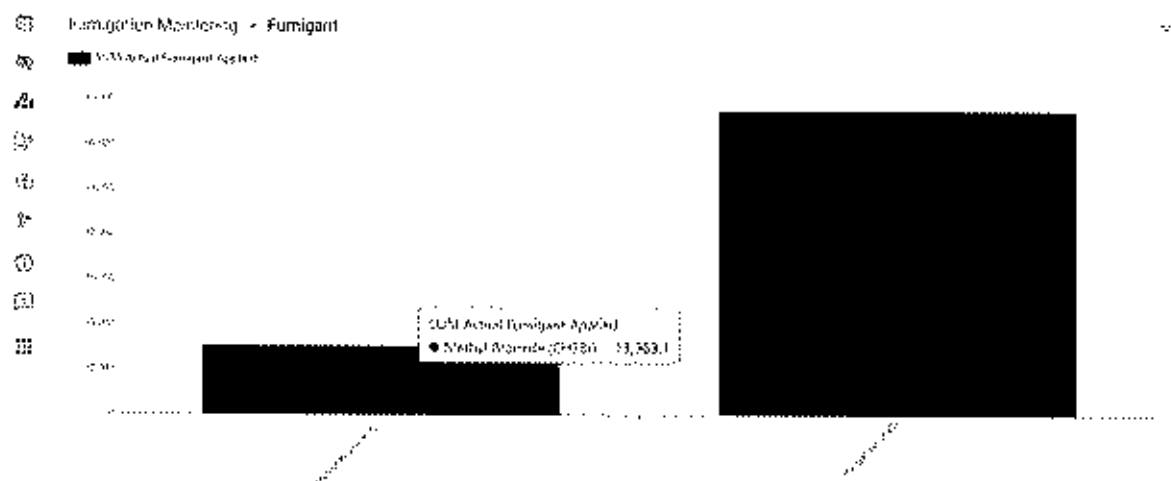


KarasbinaIndonesia@karasbinaIndonesia.co.id





SUM actual fumigant applied



Future Plan

- ☐ Implemented in all regions of Indonesia (only applied in Surabaya area at the moment)
- ☐ Including the Fumigation and Gas Clearance Certificate
- ☐ Involving company registration and its audit report recording
- ☐ Profiling/assessment of treatment providers' performance based on data analysis
- ☐ Fumigant stock by purchase and use

Acknowledgments

Fumi-Trust Team:

1. Marsanto
2. Zuhri
3. Heri
4. Masanto
5. Wawan
6. Rangga
7. Nur Rachman



Thank You



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**DEMOCRATIC REPUBLIC OF TIMOR-LESTE
MINISTRY OF AGRICULTURE LIVESTOCK FORESTRY AND
FISHERIES (MALFF)**

DIRECTORATE OF QUARANTINE BIOSECURITY UNIT (DQBU/NDQB)

**Quarantine Services for Import
Agriculture Products In Timor Leste**

Presented

By

Dr.Dvm. Manuel da costa Msi.

Director UQB

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**Quarantine and
biosecurity services for
food safety imported
agriculture products in
Timor Leste**



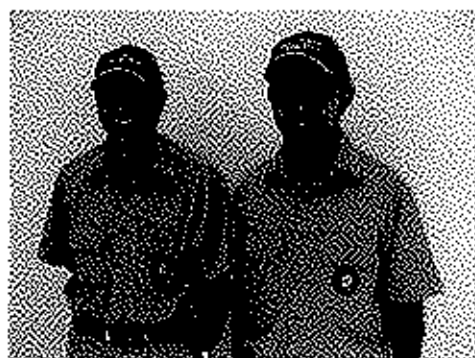
Objective
To ensure the safety of
the food supply and the
health of the population
by providing quarantine
services for imported
agriculture products.

History of Timor Leste quarantine



2003

Servico de Quarentena
2 full time officers in Dili
Part time officers in the
districts for border posts



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History Timor Leste quarantine service

2025

Directorate of Biosecurity
Quarantine Unit
69 full time officers in Dili
45 full time officers in district
offices



Batugade



Dili



Entry point installation upgrades



Animal health PQE



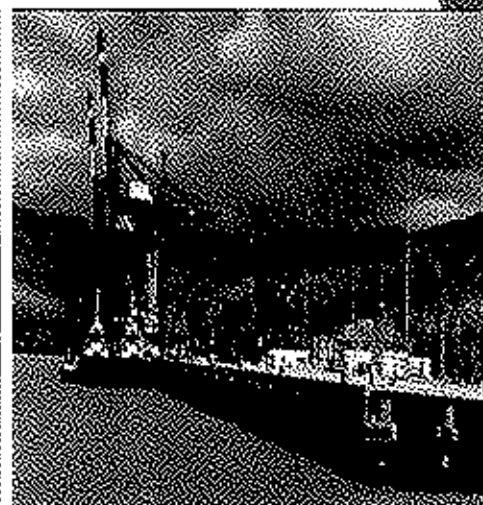
Mini
lab2025

5

Entry point installations



Dili Port 2004



Tibar Port 2025

4

Timor Leste - WTO member

- ❖ The parliament of Democratic Republic of Timor-Leste (RDTL) ratified the membership to the World Trade Organization (WTO) in 2024 and ratified World Organization for animal health in 2017
- ❖ Timor Leste was the 166th country to join the WTO in February 2024
- ❖ Timor Leste has been a member for World Organisation Animal Health (WOAH) since 2010 and Codex 2018
- ❖ Timor Leste working towards gaining membership to the International Plant Protection Convention (IPPC) and Association of South East Asian Nations (ASEAN).

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Based On Quarantine Decree Law & Regulation

- ❑ **Quarantine now working with new Decree Law no 41/2023 Animal Quarantine and Decree law no 36 /2023 Plants Quarantine 31 may 2023**
- ❑ **Organic MALFF Decree law no 77/2023, 4 October 2023**
- ❑ **Covid 2019 - 2022 country emergency condition make change**
- ❖ **(Old Decree-Law Quarentine N.º 21 /2003, 31 December 2003)**
- ❖ **(General Regulation Quarantine No I / 2006) 20 September 2006 unused**



8

Based On Quarantine Decree Law & Regulation

- Quarantine working with new Decree Law no 41/2023 Animal Quarantine and Decree law no 36 /2023 Plants Quarantine 31 may 2023
- New Decree laws improve compliance with international standards and commitments with WTO accession process
- Animal and Plant decree laws provides a distinction between technical concepts of animal health and plant health international standards e.g IPPC and WOAH



9

Based in Quarantine decree Law & Regulation

- ❖ Quarantine decree law no 41 and 36 article 1-10, 32, 35 about prevention, protection of Timor Leste from exotic plant pest and animal (aquatic and terrestrial) disease
- ❖ Based on Quarantine law the agriculture product for import must be accompanied by import permit

Objective import risk analysis (pre-border)

- ❑ Identify hazards for animal and fish diseases and plant pests
- ❑ Management of pest and disease risk for importation
- ❑ Communication of pest and disease risk to prevent, control and treat the agricultural products

Based on

- ❑ Likelihood of entry, establishment and spread
- ❑ Consequences - economic, social and environmental

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1 415 species microorganism pathogen Of public health

- ▶ **868 from 1415 (61,3%)** classification zoonosis
- ▶ **175 from 1415 (12,4%)** species to *emerging diseases*: 132 from 175 (75%) zoonotic or (*emerging zoonoses*)

Priority disease and pest lists

Priority lists for animal disease and plant pests have been developed. These lists help to inform preparedness activities for surveillance and diagnostics

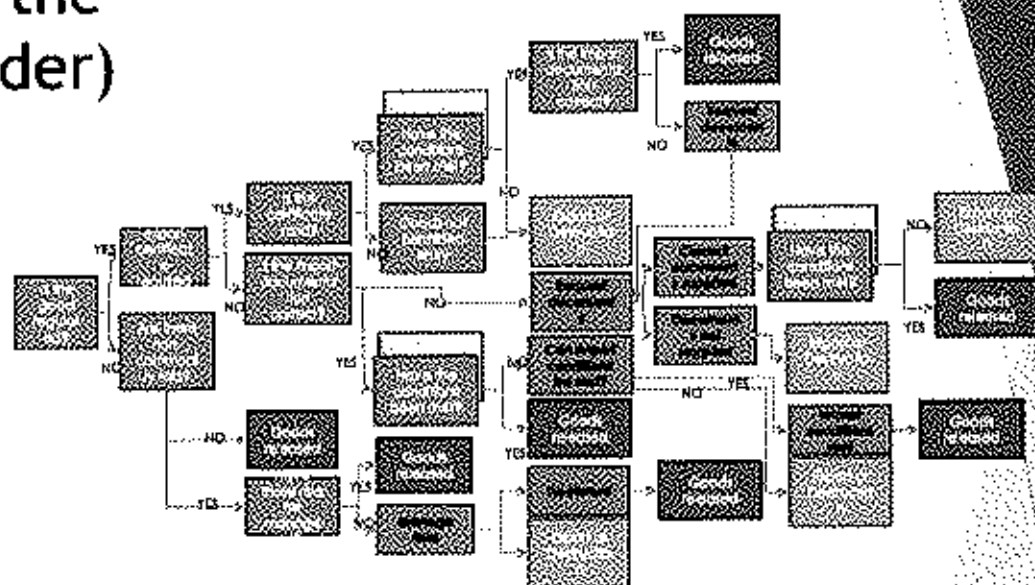
- Priority animal disease list developed in 2023
- Priority plant pest list developed in 2024

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Import permits (risk analysis) quarantine have completed for other countries

- ❑ Brazil December 2023 and March 2024 for chicken meat, pork and beef
- ❑ Indonesia December 2023 for chicken eggs, pigs, cut flowers, chicken feed (Kupang and Bali only)
- ❑ Malaysia February 2024 for chicken eggs, layer end chicken meat and fish product. Layer end chicken meat has not been allowed because have not followed, ISO, high contamination and not appropriate packing and labeling.
- ❑ Philippines February 2024 for fighting cock (chickens), duck and pig feed
- ❑ China May and June 2024 for fish product
- ❑ USA for chicken leg quarters October 2024,
- ❑ Vietnam for fish product
- ❑ China for plants products have not done an import risk assessment

Import assessment (At the border)



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Timor-Leste Quarantine Action

1. Inspection
2. Hold
3. Re-Export
4. Destruction
5. Release
6. Observation
7. Treatment
8. Isolation

Management food safety in Timor Leste

TQM



**Prerequisite program
(GHP/GMP)**

HACCP, ISO 22000

**Risk-based
Food Safety**

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Food safety system in Timor Leste

- Inspections and laboratory Test (*end product testing*)
- Surveillance
- *Good practices*
- HACCP
- ISO 22000:2005
- FSO (*food safety objectives*)

Future activities

- Capacity building for aquatics biosecurity
- Border inspection intermediate level training (certification and legislation)
- Development of SOPs for border operations
- Training and use of ASYCUDA system
- 12 month import risk analysis training with DAFF



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Thank you



Obrigado Barak

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Strengthening Regional Biosecurity and Phytosanitary Systems

Quarantine Regulators Meeting No. 15, May 2025

Chris Dale
Director, International Capacity Development - ACPPO



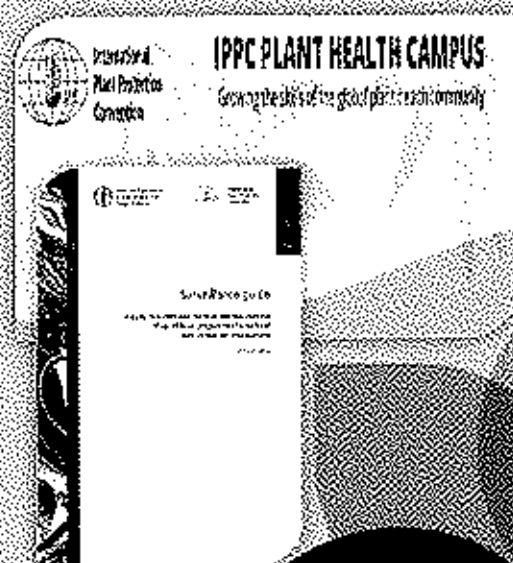
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International Context



International Plant Protection Convention (IPPC)

- The International Plant Protection Convention (IPPC) is an intergovernmental treaty signed by 184 member countries
- International Standards for Phytosanitary Measures (ISPMs) are recognised by the WTO as international benchmarks for trade in plant commodities
- The IPPC and ISPMs help to:
 - prevent the introduction and establishment of plant pests
 - protect farmers from economically devastating pest outbreaks
 - prevent damage to the environment and protect ecosystems
 - protect industries and consumers from the costs of pest control or eradication
 - facilitate international trade.



Regional Context



Asia and Pacific Plant Protection Commission (APPPC)

The Plant Protection Agreement for Asia and Pacific Region is an intergovernmental treaty, administered by the Asia and Pacific Plant Protection Commission. The Commission consists of representatives of all 25 member countries.

Strategic priorities of the APPPC include;

- Developing capacity, including our capacity to coordinate and train staff
- Developing measures for plant protection and promoting integrated plant health management (IPHM)
- Strengthening information management
- Coordinating input into international systems (assisting with the development of ISPMs),
- And Promoting and implementing the IPPC ePhyto Solution



Department of Agriculture, Fisheries and Forestry

Pacific Plant Protection Organisation (PPPO)

- The PPPO works in the interest of the national plant protection organizations (NPPOs) of the Pacific Island Countries and Territories (PICTs). The PPPO coordinates harmonization of phytosanitary measures and fosters cooperation in plant health, plant protection and other phytosanitary matters among Members as well as with countries and organisations outside the Pacific region.
- The PPPO ensures that the views and concerns of the PICTs are adequately taken into account in the development and implementation of global phytosanitary measures;
- Assists in the development and implementation of effective and justified phytosanitary measures;
- Provides a framework for regional and global co-operation in phytosanitary matters consistent with international principles for trade in plants and plant products;



Department of Agriculture, Fisheries and Forestry

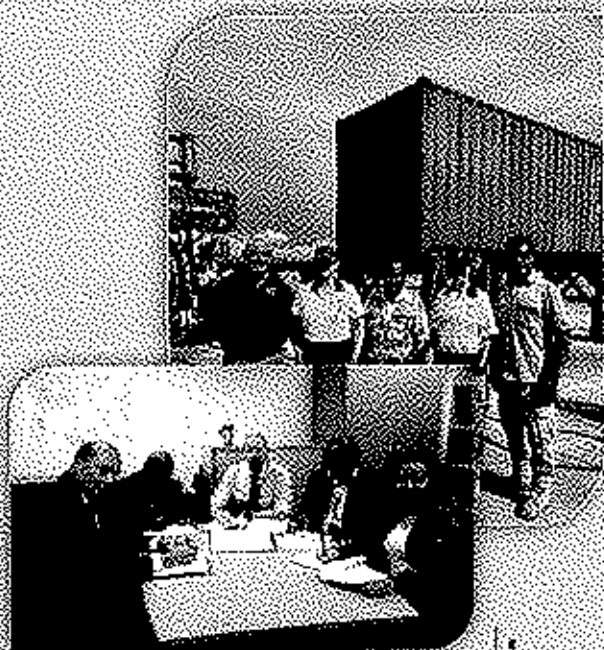
Coordination and Implementation of Capacity Development Initiatives



International Capacity Development Section (ICDS)

- ICDS coordinate and deliver biosecurity capacity development programs and initiatives across Asia Pacific region on behalf of ACPPO and DAFF.
- Currently managing and delivering 10 regional and bilateral programs across SE Asia and Pacific.
- The team has a mixture of technical and operational expertise and experience in border biosecurity, trade and market access, phytosanitary measures and international development.
- Representation at the international level through the IPPC Implementation and Capacity Development Committee (IC), APPPC leadership group, PPPG leadership group, FAO global initiatives (FAW, Climate), and STDF project delivery.

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Capacity Development Program Design & Implementation

Technical Support

Operational Support

Institutional Support



ASEAN Regional Diagnostic Network (ARDN)

- Strengthening diagnostic capacity across the 10 ASEAN countries
- Commenced in 2010 and is currently in its 4th phase
- The network enables accurate identification of economic pests, ensuring they are actively assessed and managed

Phase 4 will:

- further address gaps in diagnostic resources and skills
- strengthen networking of expertise between ASEAN diagnosticians and counterparts in other countries
- promote adoption of new technologies
- establish remote collaborations as a familiar work practice among ASEAN diagnosticians



Pacific Biosecurity Partnership Program (PBPP)

- The Pacific Biosecurity Partnership Program supports the regional implementation and harmonisation of SPS measures for plant health and animal health.
- It also facilitates agricultural trade and market access support through technical support activities in close collaboration with regional programs such as FAO, PACER Plus, PHAMA Plus, MDF, SPC.
 - Plant trade and market access technical and operational support
 - Further support for the adoption of Generic ePhyto National System
 - Pacific Export Pathway biosecurity operational training across four countries
 - Technical and operational support to Biosecurity Vanuatu
 - Regional surveillance and information management through the Pacific Pest List Database (PLD)



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11

Regional Sea Container Project

- Aims to address the regional level risk of hitchhiker pests that can be carried via sea containers, their cargoes and associated packaging.
- Adopting a systematic approach to comprehensively manage this risk through 3 focus areas
- Pacific Strategy for the Sea Container Pathway Workshop was held in Fiji November 2024 with over 60 participants from the region



Expanded use of offshore controls



Targeted onshore risk intervention and surveillance



Partnerships with industry, government and researchers



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Vanuatu Border Biosecurity Strengthening Project



Department of Agriculture, Fisheries and Forestry



Bilateral Context

Solomon Islands Biosecurity Development Program (SIBDP)

- DAFF has worked closely with the Solomon Islands Ministry of Agriculture and Livestock (MAL) and Biosecurity Solomon Islands (BSI) at a bilateral level for over a decade to strengthen Solomon Islands national biosecurity system, help respond to exotic plant pest and animal disease detections, and support and facilitate agricultural trade and market access opportunities.
- The SIBDP has provided bilateral technical and operational support to Biosecurity Solomon Islands (BSI) since 2013.
- Over the past decade, the SIBDP has supported the implementation of the Solomon Islands Biosecurity Act (2013) and the transition from quarantine (SIACS) to Biosecurity (BSI), strengthening national pre-border, border and post-border biosecurity systems.

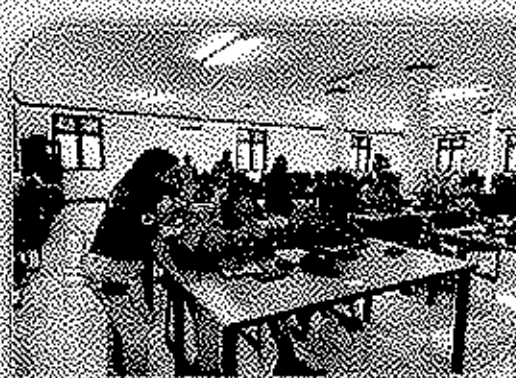


15

Timor-Leste Biosecurity Development Program (TLBDP)

Timor-Leste Biosecurity Development Program
(2023–2026)

- Aims to improve the consistency of the Timor-Leste biosecurity system by supporting collaboration and strengthening the technical, operational, organizational and institutional capacity and capability within Timor-Leste Ministry of Agriculture, Livestock, Fisheries and Forestry.
- Aims to provide technical and operational capacity development to supports the transition to official membership of the IPPC, WTO and ASEAN.



16

Papua New Guinea Biosecurity Twinning Program

**PNG Biosecurity Twinning Program
2025–2028**

- Aims to strengthen PNG's baseline biosecurity capability by embedding sustainable biosecurity system enhancements, contributing to reduced regional biosecurity risk and support PNG's agricultural trade goals.
- Includes in-country DAFF officer working alongside the National Agriculture & Quarantine Inspection Authority.

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International Plant Health Surveillance Program (IPHSP)

- The International Plant Health Surveillance Program provides a critical role in the pre-border early warning and preparedness for exotic and emerging plant pest risks in Timor-Leste, Papua New Guinea and the Solomon Islands.
- For over three decades, the program has worked jointly with plant biosecurity officials across these three countries to improve capacity and capability by building technical skills in field surveillance, diagnostics and in preparedness, and response.

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Aus-Vietnam Enhanced Economic Engagement Strategy (VEEES) – Surveillance and Diagnostics

- Technical training was delivered by Australian technical experts to plant health scientists in Vietnam to apply technologies and skills to survey and identify new target pests of importance to plant biosecurity and trade. All target pests were identified and selected in collaboration with PPD.
- Surveillance training targeted mealybugs on major export crops (i.e. banana, durian, and passionfruit), determination of *Xylella fastidiosa* pest free areas (PFA) in Vietnam and *Xylella fastidiosa* vector surveillance.
- Diagnostic training targeted pest nematodes and scale insects (e.g. mealybugs, hard and soft scales).



Thank you

- chris.dale@aff.gov.au
- icds@aff.gov.au



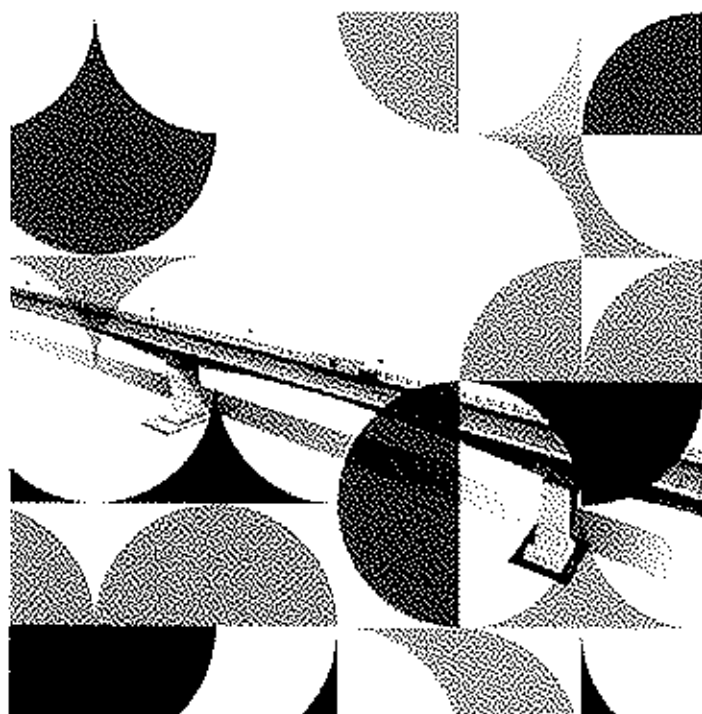
*Promoting safe agri-food trade through
partnerships and innovation - lessons
from STDF's work*

Quarantine Regulators Meeting (QRM)
28 April – 2 May 2025, Manila, The Philippines

Catalina PULIDO
STDF Secretariat

[FIND OUT MORE](#)

[SCHEDULED FOR 2025: QRM](#)



WTO SPS Agreement

Recognizing the right to
protect human, animal
and/or plant life and health



Obligation to avoid
unnecessary barriers to
trade



[SCHEDULED FOR 2025: QRM](#)

STDF | [education](#)

What is the Standards and Trade Development Facility (STDF)?

A Global partnership that helps developing countries improve their food safety, and animal and plant health capacity to meet **SPS requirements**, based on international standards, to gain or maintain market access.



Food and Agriculture
Organization of the
United Nations



WORLD BANK GROUP



World Health
Organization



World Organisation
for Animal Health
Founded as OIE



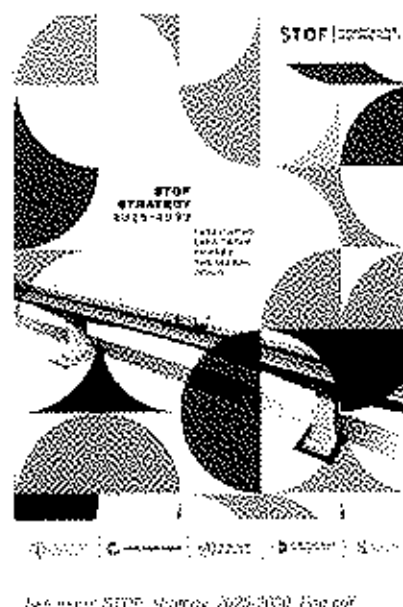
WORLD TRADE
ORGANIZATION

STDF | stdf.int

What does the STDF do?

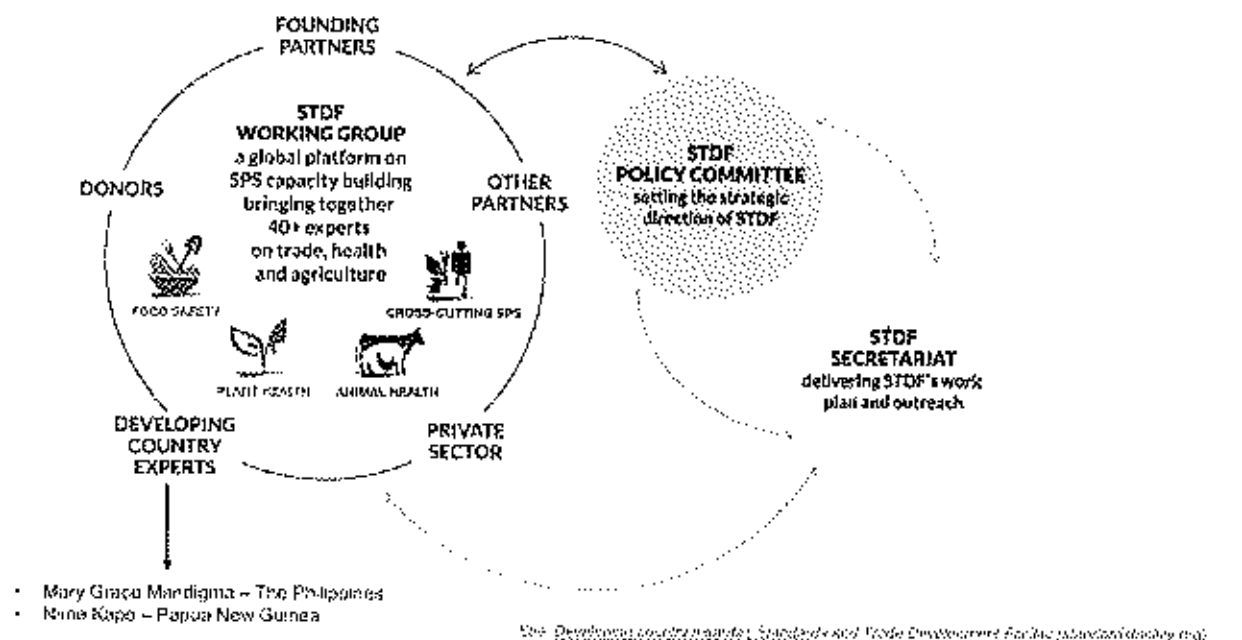
Three Workstreams:

1. Global platform for coordination and dialogue
- +
2. Knowledge work to identify and disseminate good practices
- +
3. Funding mechanism to develop and implement innovative, collaborative projects based on international standards



STDF | stdf.int

Global coordination platform



STDF | www.stdf.int

STDF | www.stdf.int

Funding Opportunities



1. Project Preparation Grants (PPG):

Seed funding (up to US\$ 50,000)

1. Apply capacity evaluation / prioritization tools
2. Assess feasibility before project development
3. Develop SPS capacity building project proposal



2. Projects Grants (PG):

- Up to US \$1,000,000, duration of three years
- Convene
- Innovate
- Learn
- Catalyse
- Countries' contribution:

- ✓ LDCs and OLICs = 10%
- ✓ LMICs = 20%
- ✓ UMICs = 60%



STDF | www.stdf.int

STDF | www.stdf.int

STDF portfolio

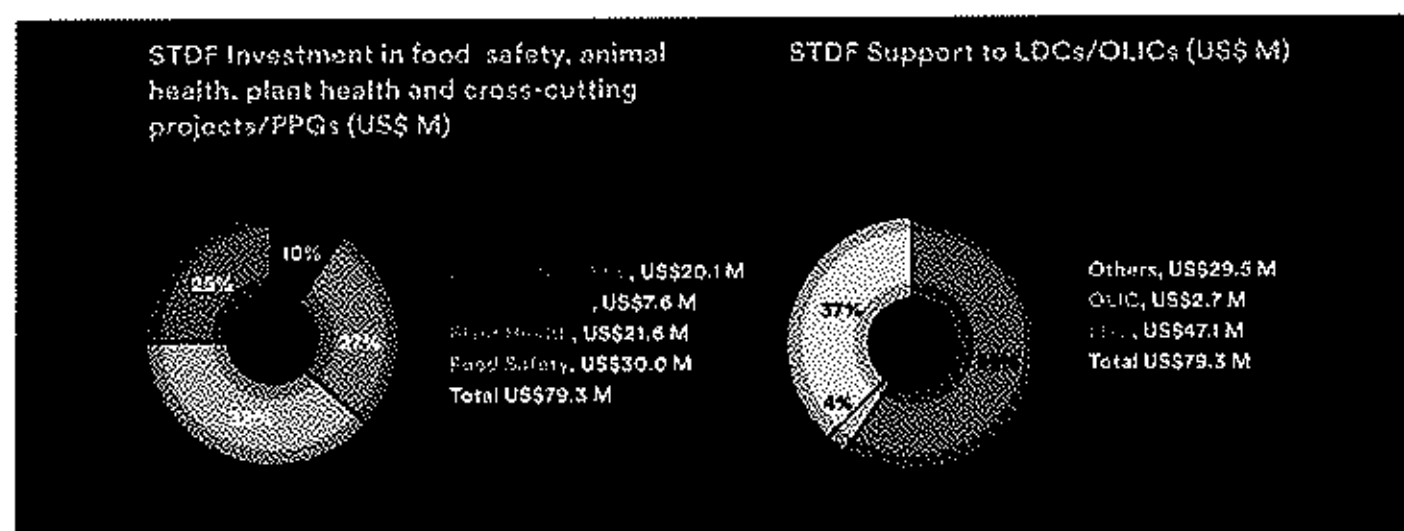


Figure 1. STDF investment portfolio

STDF | 2022/23

Strong support for LDCs and Africa

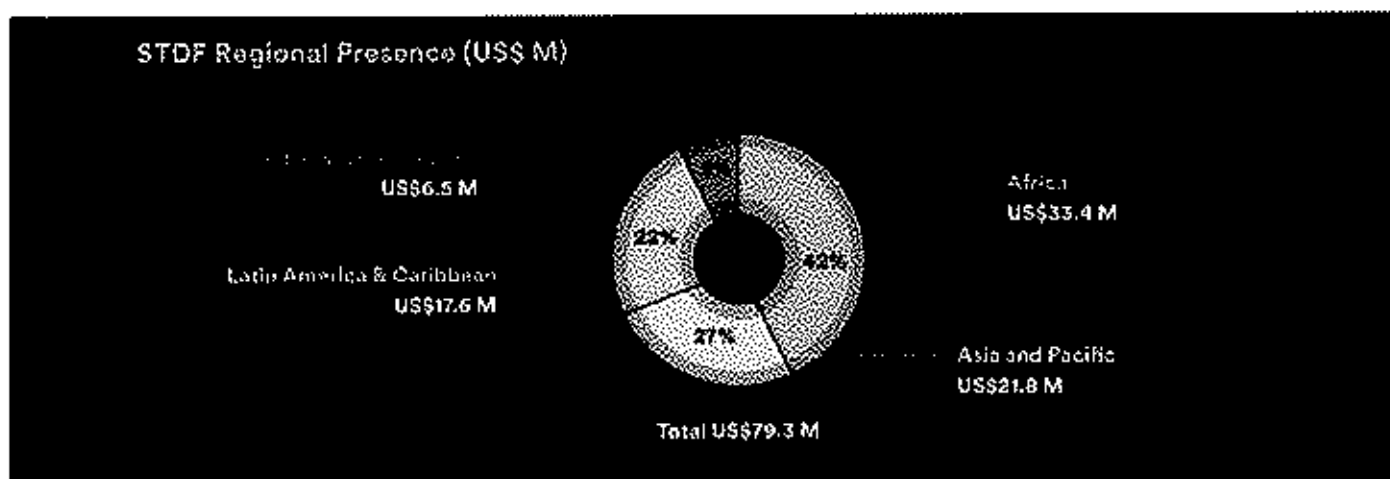


Figure 2. STDF regional presence

STDF | 2022/23

Ongoing Project Preparation Grants (PPGs)

Mitigating Aflatoxin contamination in peanuts



India /Regional
Implemented by FAO*
STDF/PPG/1027*

Promoting Market Access in the Cashew Nut Value Chain



Cambodia, Viet Nam
Implemented by Mekong Institute (MI)*
STDF/PPG/1010

* STDF/PPG/1027 and STDF/PPG/1010

STDF/PPG/1027

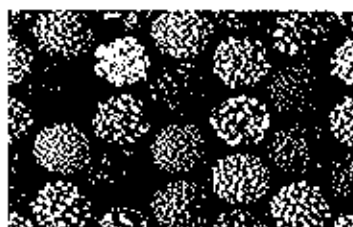
Project Grants

Strengthening phytosanitary compliance to boost seed trade in Asia-Pacific

Bangladesh, Cambodia, Laos PDR, Nepal, Philippines, Viet Nam and Thailand

✓ Increase seed trade and market access for the Asia-Pacific region by increasing the capacity of national plant protection organizations (NPPOs) to meet relevant phytosanitary standards

- Identify NPPOs' specific needs
- Build NPPOs' knowledge on relevant ISPMs
- Create a portal of regional phytosanitary certification requirements for seeds
- Facilitate implementation of ePhyto
- Strengthen public-public and public-private partnerships



Implemented by APAARI (Asia-Pacific Association of
Agricultural Research Institutions)

* STDF/PPG/1027 and STDF/PPG/1010

* STDF/PPG/1027 and STDF/PPG/1010

STDF/PPG/1027

Mitigating pesticide residues in Latin America using biopesticides

Argentina, Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru.

- ✓ Enhance compliance with MRLs and ensure market access by integrating biopesticides with conventional pesticides for effective pest control

- Establishing a regional research center
- Harmonizing biopesticide regulations
- Generating residue data
- Improving plant protection for minor crops
- Promoting biopesticide use



- **Related completed project in Asia:** Bangladesh, Lao PDR, Malaysia, Nepal, Philippines, Sri Lanka, Thailand, Viet Nam

- **Related completed project in Africa:** Botswana, Kenya, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe

Implemented by: Inter-American Institute for Cooperation on Agriculture (IICA)

For more information, visit:

See more: <https://starhubdocuments.org/2023/11/23/>

STOP | 10007-2023

Pacific Beekeeping Enabling Environment (BEE)

Niue, Samoa, Fiji, **Solomon Islands**, Vanuatu, **Papua New Guinea** and Tonga

- ✓ Strengthen SPS capacity and enhance market opportunities for honey and other bee products in the Pacific region

- Conducting nation-wide disease surveys to assess and manage honeybee pests
- Building beekeeper capacity through training and extension services on good apicultural practices and SPS requirements
- Establishing a regional governance mechanism to coordinate support for sustainable apiculture industry development and market access



Implemented by: Pacific Islands Forum Secretariat (PIFS)

For more information, visit:

See more: <https://starhubdocuments.org/2023/11/23/>

STOP | 10007-2023

Improving pig biosecurity and African Swine Fever (ASF) control in 4 ASEAN countries

Cambodia, Laos, The Philippines and Viet Nam

- ✓ Control the spread of African swine fever (ASF) and secure their trade in pork and pork products, through biosecurity measures.
- Trained over 400 stakeholders, developed e-learning materials.
- Standardized tools and risk assessment measures for biosecurity management.
- Contributed to the national ASF Strategic Plans and supported the dissemination of Circular on animal disease-free zones.
- Identified key barriers to ASF control and provided recommendations for establishing Animal Disease-Free Zones.
- Supported the development of biosecurity SOPs and ASF surveillance programs



Implemented by: Ecole Nationale des Services Vétérinaires - France Vétérinaire International

Source: <https://www.who.int/news-room/photo-gallery>

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STOF | 000000

Knowledge work



Good practice on latest SPS solutions:

Electronic SPS certification

Public-private partnerships

Prioritizing SPS investments (P-IMA)

Good regulatory practice

Source: <https://www.who.int/news-room/photo-gallery>

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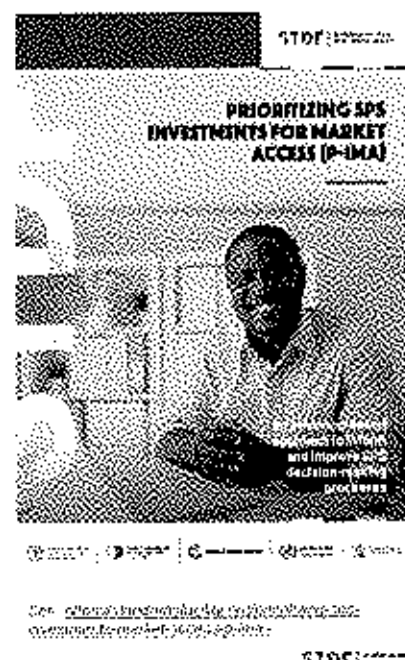
Prioritizing SPS needs

Why?

- Many different SPS investment needs exist
- Resource constraints (national government, donors)
- Decision-making processes sometimes ad hoc or not transparent
- Increased competition for financing
- Need compelling evidence to secure funds for SPS capacity building

How?

- Tool to inform and support SPS decision-making processes
- Structured approach to establish priorities between alternative SPS capacity-building options
- Process for diverse stakeholders (public, private, knowledge institutions) to provide inputs to decision-making

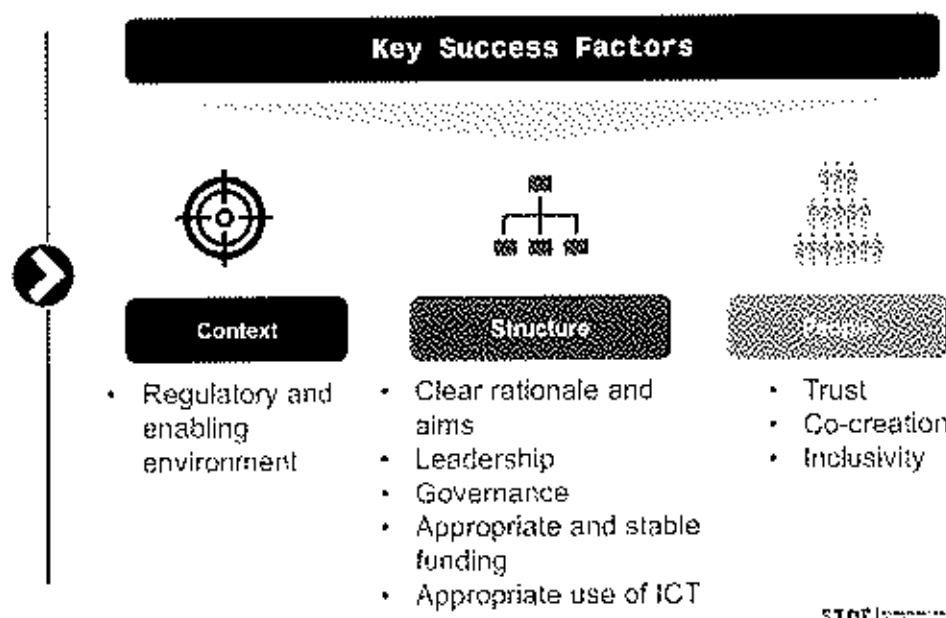


STDF | Guidance Note

Public-private partnerships (PPPs)

Government authorities and the private sector working together

- PPPs address SPS challenges and improve outcomes.
- By sharing responsibilities, resources and risks to achieve common objectives and mutual benefits.
- STDF PPP case stories
- New STDF PPG Guide launched

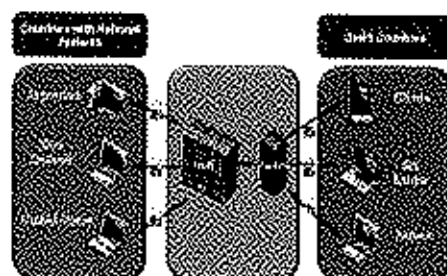


STDF | Guidance Note

Promoting paperless trade: SPS electronic certification

ePhyto

- Globally harmonized system to exchange electronic phyto certificates
- Improved security and reduced potential for fraudulent certificates
- Efficiencies in the arrival and clearance of plants and plant products



WTO Secretariat, Geneva, 2012

More from www.stdfsecretariat.org/Certification and <http://www.standardsfacility.org/Cert>

eVet

Study to explore opportunities and recommendations for WOA (several countries incl. Eswatini, Nigeria, Zimbabwe)

Improve understanding about current practices on e-cert and single windows

Developing recommendations and a plan to move forward on eVet

New STDF project in LAC started this year

STDF/2012/026

Find out more



Visit STDF website
www.standardsfacility.org

Apply for STDF funding (PPGs, Projects)

Find out the eligibility criteria
See examples of completed Projects/PPGs
Read the Guidance Note for Applicants
Consult with regional/national stakeholders



Use STDF good practices

Publications, briefing notes, videos, etc.



Sign up for STDF e-news

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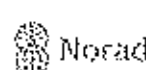
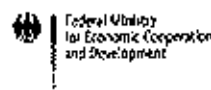
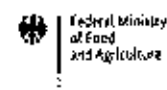


STDFSecretariat@wto.org

WTO Secretariat, Geneva, 2012

STDF/2012/026

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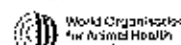
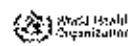
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Thank You

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STANDARDS *and* TRADE
DEVELOPMENT FACILITY



STDF | 10202021

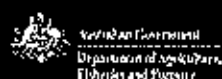
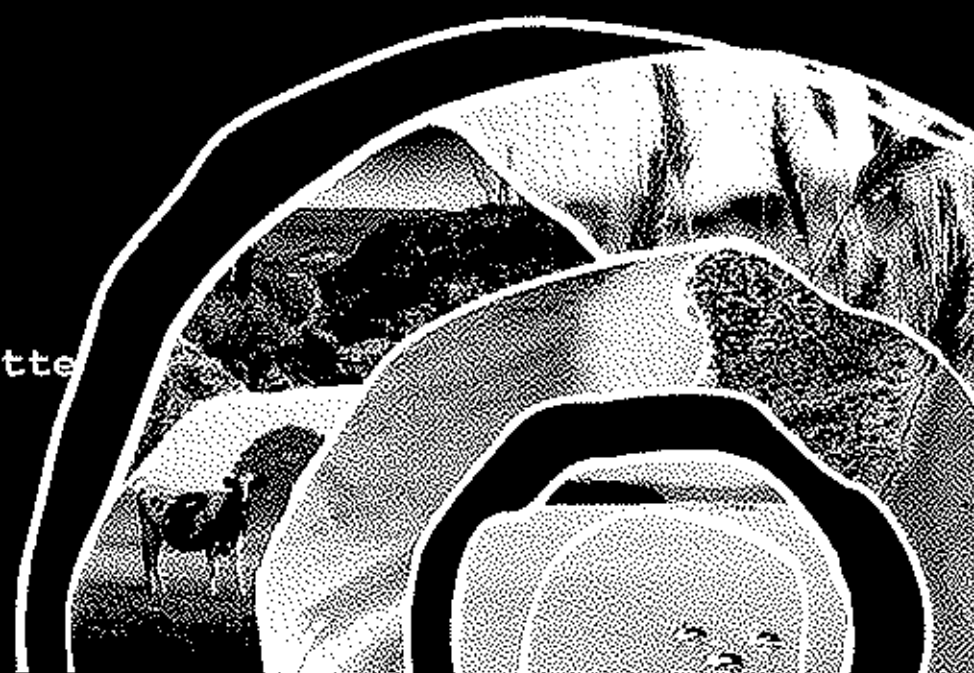
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Australian Government
Department of Agriculture,
Fisheries and Forestry

Compliance and Enforcement Di

Strengthening Compliance: Operations Coordination Committee



A Risk-Based Case Management Approach

Each compliance case is thoroughly evaluated through a robust, transparent and repeatable risk assessment using the Case Categorisation and Prioritisation Model (CCPM). This risk-based approach ensures that cases are dealt with consistently and effectively, aligning resources and responses with the department's priorities and goals. Depending upon the nature and severity of the non-compliance reported, the Department has a range of non-compliance actions and tools that can be applied, and cases can have a variety of outcomes.



Comprehensive and Integrated Non-compliance Reporting

Non-compliance reporting information supports a broad remit of CED work:



Benefits and outcomes from comprehensive non-compliance reporting...

In addition to the direct referrals for action, non-compliance reporting generates a variety of products for stakeholders to support regulatory activities:


- Non-Compliance reports, statistics and pathway analysis
- Trending and forecasting
- Increased intervention rates
- Access to a variety of regulatory tools and outcomes
- Behaviour validation
- Targeting activity
- System reforms
- Increased regulatory posture with clients

Operations Coordination Committee (OCC) 2023-2024 Snapshot


The Operations Coordination Committee (OCC) is the peak decision-making forum for the application of departmental resources to manage high-risk non-compliance. It is transparent in its application of policy and seeks compliance through effective application of regulatory responses and sanctions.

Taking a collaborative, risk-based approach to decision-making, it uses the Case Categorisation and Prioritisation model to make informed, defensible decisions, and to align resourcing and response with the department's priorities, functions, and strategic objectives.


The OCC is supported by the Operations Coordination Section (OCS), the Compliance and Enforcement Division's central point of coordination for all compliance and enforcement operational activities. The OCS is responsible for ensuring the OCC is provided with the appropriate level of insight to inform the operational response to serious non-compliance.



The OCC was first convened on 25 January 2022.

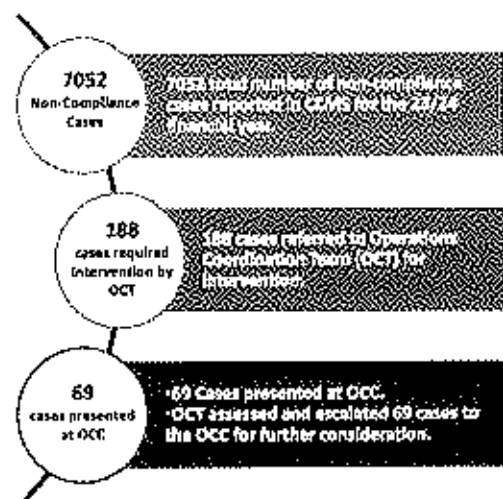


The OCC was first comprised of only the First Assistant Secretary and the Assistant Secretary cohort from Compliance and Enforcement Division.

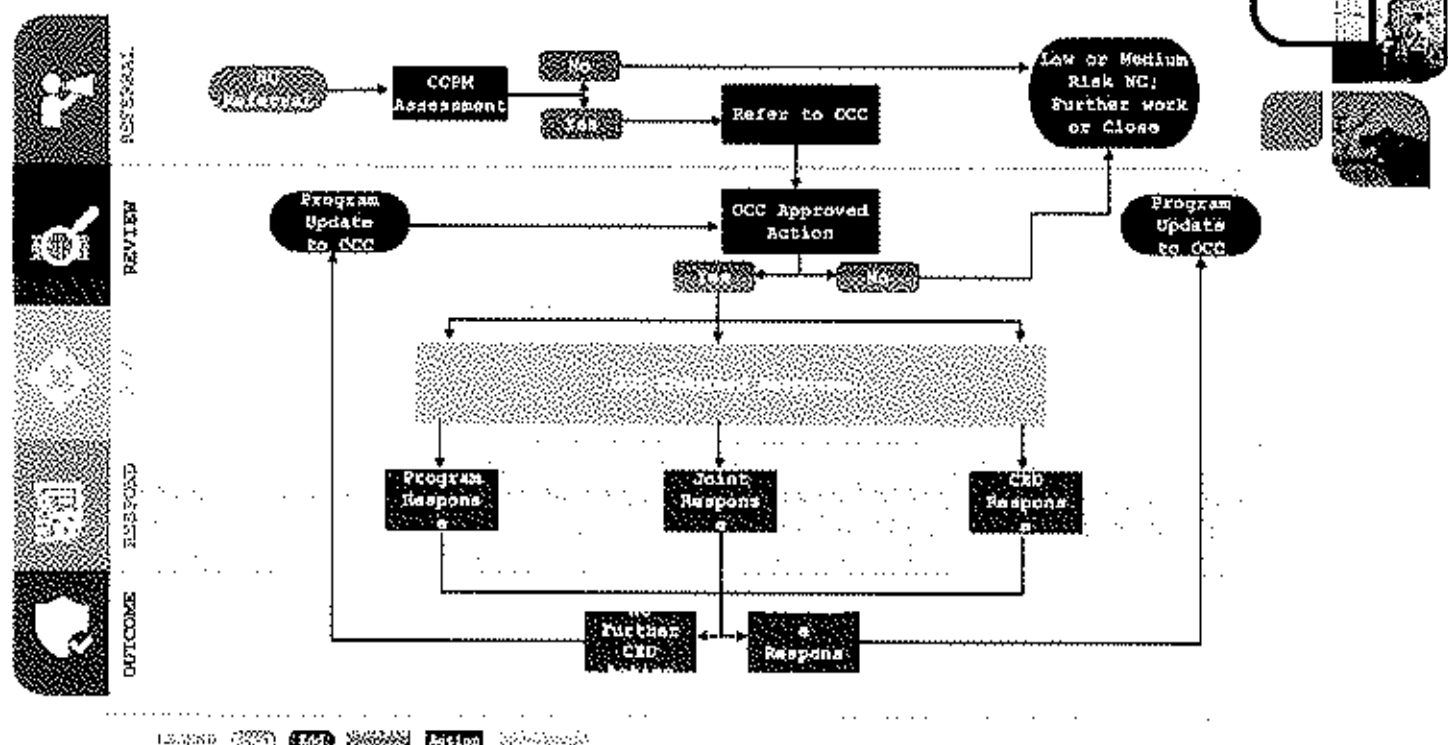


The OCC has since grown to include 27 permanent members across 11 divisions.

The OCC determines the most appropriate and proportionate response to be taken in relation to high-risk non-compliance across all regulatory systems. The OCC reviews and endorses compliance plans for the department's regulatory systems, which inform the OCC's resource allocation decisions and guide the actions of the response and enforcement areas of the division.



OCC Referral Process

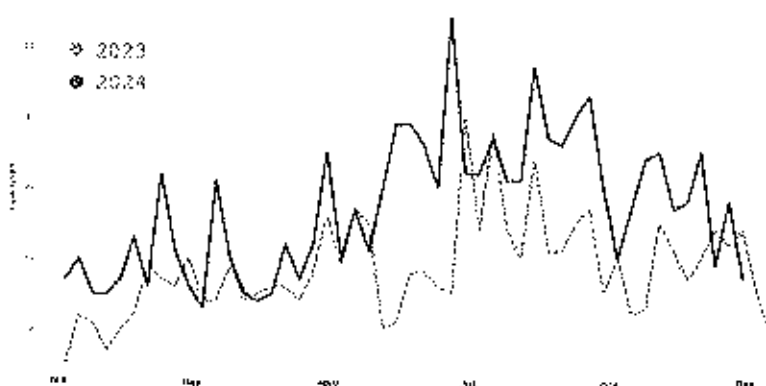


Operations Coordination Section Meat and Food Non-compliance Trends Analysis 2024

Non-compliance trends in Meat and Food

- Cases of non-compliance in meat and food have risen 40.7% from 2023 to 2024. Overall non-compliance reporting has remained at similar levels to last years' figures, so this trend is a significant difference.
- This increase is due to the proactive application of profiles by the Compliance and Enforcement Division. This strategic work has sparked 6 campaigns targeting meat and food through the Self Assessed Clearance (SAC) pathway.
- Non-compliance cases breaching Imported Foods requirements has increased by 20% from 2023. The increased surveillance in the SAC pathway has revealed food Importers utilising this pathway to circumvent both Biosecurity and Imported food controls.

Comparison of Non-Compliance Meat and Food cases for 2023/24



Sea Freight Meat & Food Non-Compliance

Sea freight saw increases in meat and food non-compliance across almost every non-compliance category from 2023 to 2024.

Stand out increases in were observed in the following categories:

Goods arriving without a permit

Mis-declaration of goods

Supplier non-compliance

These increases are partly due to improved reporting and uptake of CCMS, which have greatly enhanced oversight on these issues.



Spotlight on Self Assessed Clearance (SAC) non-compliance

In June 2023, a consignment of mis-declared bonsoi was identified during self-assessed clearance (SAC). This initial interception sparked a cascade of work that has expanded broadly across CED.

Targeted profiling on the pathway has led to significant interceptions, further intelligence products, and several operations.

Over two tonnes of illicit meat and food products have been seized, and intelligence analysis of these interceptions has revealed a broad network of non-compliance activity.

Intelligence products on this pathway have revealed that there are:

- High threat freight consolidator business models that specialise in moving biosecurity goods into Australia. They have a so-called 'hard to deliver' capability for moving biosecurity risk goods to Australia outside of border controls.
- Six border control evasion methodologies being used to evade Australian biosecurity border controls for food smuggling on the non-commercial air cargo pathway. The methodologies are shifting in response to our compliance activity indicating highly responsive coordination.

Risks and Vulnerabilities

This lends to several risk considerations:

- Compliance processes are impacted by the challenge of proving intent and solicitation.
- Offshore entities are deliberately engaging in and promoting business models to circumvent border controls. These entities are broadening the uptake of non-compliant behaviour by regular individuals and openly advertising departmental weaknesses.
- Third party premises and non-CAPEC sites are vulnerable for exploitation and manipulation by both onshore and offshore actors.
- There is an indication of broader non-compliance on this pathway.

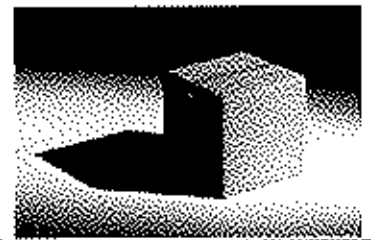
SAC Meat & Food Non-Compliance Statistics for 2024

The SAC pathway is a significant source of case volume into the Compliance Case Management System (CCMS), representing 22.8% of all non-compliance cases.



- 271 cases in 2023
- 480 cases in 2024

In 2024, there was a significant 77% increase in non-compliance cases relating to meat and food via the SAC pathway.



OFFICIAL



Please reach out if you have any questions or comments

Anna Brezzo
First Assistant Secretary – Compliance and Enforcement Division



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

African Swine Fever Canadian Prevention and Preparedness

Dr. Parthi Muthukumarasamy
Executive Director
International Programs Directorate

Dr. Suminder Sawhney
Senior Director
Animal Import/Export
Division

Canada

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Purpose

Today's presentation will provide information on:

- Canada's pork sector and the potential impact of ASF
- Canada's prevention and preparedness activities
- Next Steps



Canada's Pork Sector & ASF

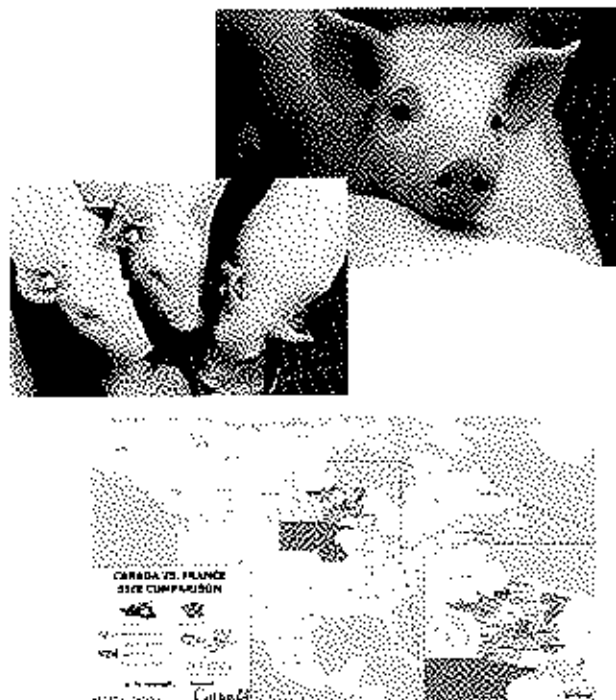
Canada's Pork Industry

Canada has a very large domestic pork industry, and is the world's 7th largest pork producer:

- 7,000 pig producers
- 27 million hogs annually
- 12.6 million hogs are in production at any given time
- Pork production occurs from coast to coast, but is concentrated in three central provinces
 - Manitoba, Ontario and Quebec account for 80%

Canada is also the 4th largest pork exporting country.

- In 2024, Canada exported pork and pork products to 81 countries valued at CA\$5.3 billion



Impacts of ASF

ASF has never been detected in Canada.

A single positive case would require that all pork and live-hog exports halt immediately.

Disease management: Canada's competent veterinary authority, the Canadian Food Inspection Agency (CFIA), and will lead efforts to contain and eradicate the disease as quickly as possible.

Trade: Immediate loss of all export markets (70% of domestic production) until disease control zones are accepted by trading partners for partial export resumption.

Surplus hogs: Without trade, industry will have a large oversupply of pork relative to domestic demand. Millions of animals without a suitable market would need to be humanely euthanized to address concerns for animal welfare:

- Up to 50% of the hog herd may need to be culled over a period of approximately 6 months.
- Animal welfare concerns could emerge within days of the market disruption
- Large impacts to the environment, farmer mental health

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Government of Canada Funding

In 2019, the Government of Canada announced a 5-year investment of **\$31 million** for CBSA to train and deploy 24 new detector dog teams.

In 2021, Canada's Minister of Agriculture was mandated to: *"...take every necessary precaution to prevent the introduction of African swine fever within our borders, and continue to work with provinces and territories and industry stakeholders on prevention and preparedness measures, including a cost-shared response plan."*

In response, the Government of Canada has continued to invest heavily in ASF prevention and preparedness:

- In August 2022, the Government of Canada announced a 3-year investment of up to **\$45.3 million** for CBSA, CFIA and AAFC to enhance efforts to prevent ASF from entering Canada and prepare for a potential outbreak.
- In March 2025, the Government of Canada announced:
 - An additional one-year **\$6.1 million** in funding was announced for CFIA and CBSA to continue ASF prevention and preparedness activities.
 - A commitment of up to **\$567.16 million** to support hog producers should there be a closure of key export markets for Canadian pork products and live pigs due to an ASF outbreak in Canada or the United States

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ASF EMB and *Pan-Canadian Action Plan*



Canada

Manitoba



Ontario



Québec



Animal Health Canada



CMC
CANADIAN MEAT COUNCIL

- Recognizing the potential impact ASF would have on Canada, the African Swine Fever Executive Management Board (EMB) was formed in 2019 to support coordination between stakeholders and to develop and advance a *Pan-Canadian Action Plan on ASF*.
- The EMB is a novel approach. It includes members from federal and provincial governments, and industry. It is empowered to make recommendations, facilitate solutions and promote collaboration
- The pan-Canadian Action Plan has four pillars:
 1. Enhanced biosecurity
 2. Preparedness planning
 3. Business continuity and
 4. Coordinated risk communications

Specific Prevention and Preparedness Activities

Import Controls

Canada Border Services Agency (CBSA) is Canada's first line of defence for ASF and border services officers are trained to intercept prohibited goods. In addition to routine border controls, ASF specific initiatives have included:

- Training and deploying 22 new detector dog teams to Canada's international airports that will be used to detect and intercept food, plant and animal threats
- Targeting commercial imports for inspection via intelligence-based risk assessments that identify high-risk shipments bound for Canada on a 24/7 basis



9

ASF Hazard Specific Plan (HSP)

- CFIA's *ASF Hazard Specific Plan* provides inspectors and all stakeholders with detailed, technical information to guide response efforts to ASF in Canada
- Recent updates have included incorporating the latest technical and scientific information, within a Canadian context and lessons learned from recent experience responding to Highly Pathogenic Avian Influenza (HPAI)

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Scientific Preparedness

Canada has been recognized as a global leader in scientific and technical expertise to address problems relating to African swine fever.

The CFIA's National Centre for Foreign Animal Disease in Winnipeg has been officially recognized as a World Organisation for Animal Health Reference Laboratory for African swine fever.

- Closely monitoring the ASF virus through collaboration with scientists in Asia and Africa and ongoing collaboration on ASF vaccine development with scientists around the world
- Increasing and streamlining ASF diagnostic capacity by developing new, improved and more economical laboratory diagnostic methods
- Expanding ASF field surveillance through development and validation of new, simpler sample collection methods



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CanSpot ASF Surveillance



ASF is a reportable disease meaning veterinarians, producers, and farm staff are required to contact the Canadian Food Inspection Agency (CFIA) immediately if the disease is suspected.

CanSpot ASF is Canada's risk-based surveillance program for ASF

- Ensures early detection and supports Canada's disease-free status
- Testing is conducted at approved *Canadian Animal Health Surveillance Network (CAHSN)* Laboratories
- The program includes testing of select samples from:
 - Commercial swine herds, small-holder and pet pigs
 - Abattoirs
 - Wild pigs

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Invasive Wild Pigs

Wild pigs in Canada are invasive and cause significant ecological damage, destroy wildlife habitat, damage crops, and pose risks to human safety. They can also carry and spread diseases that threaten both wildlife and livestock, including African swine fever.

Wild pigs have established populations in three western Provinces: Alberta, Saskatchewan and Manitoba. However, wild pig populations in Canada are significantly less than in other countries.

The Government of Canada continues to work closely with provinces territories, and other stakeholders to implement Canada's *Invasive Wild Pig Strategy*, which aims to **eradicate** invasive wild pigs from Canada by 2032.

In 2024, wild pigs were added to the CanSpot ASF surveillance program. All 137 samples taken from removed animals tested negative for ASF.

If ASF is detected in invasive wild pigs, the Canadian Food Inspection Agency will lead the emergency response in close collaboration with all levels of government, indigenous communities, and relevant stakeholders to contain the disease and limit its impact.

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Preparedness Exercises

2024-2025

AAFC Surplus Hog Table Top Exercise	May 2023
CFIA/AAFC Unified Communications Team Functional Exercise	October 2023
Transboundary Cross-Border Table Top Exercise	October 2023
CFIA ASF Executive Table Top Exercise	November 2023
(Emergency Management Ontario) ASF Table Top Exercise	November 2023
CFIA Science Branch ASF Table Top Exercise	January 2024
CFIA International Affairs Branch Return & Redirect Exercise	February 2024
Animal Health Canada (AHC) Table Top Exercise	February 2024
Quebec Three Farm Depopulation and Disposal Functional Exercise (EQSP)	March 2024
(Alberta Ministry of Agriculture) ASF Table Top Exercise	April 2024
Stakeholder Notification Functional Exercise (CFIA)	June 2024
Traceability Functional Exercise (AHC)	September 2024
Quebec Full Scale Simulation Exercise (EQSP)	October 2024
Multijurisdictional Table Top Exercise (AHC)	November 2024
Live Swine Export Table Top Exercise (CFIA)	January 2025
	February 2025

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Selected Exercise Recommendations

- Importance of **early notification** and clear communication, especially in the early stages of an ASF investigation.
- **Common glossary/lexicon** and understanding of key terms and their definitions (e.g. high risk, non-negative, confirmed).
- Additional clarity surrounding **voluntary movement controls**.
- Sharing of **biocontainment best practices**.
- Strong need for **financial support programs** in place prior to the detection of ASF.
- Review and planning to validate appropriate **surge capacity** is available for lab testing of samples
- Review of company procedures related to **diverting/returning meat export shipments** and potential CFIA pinch points/bottlenecks in processing these applications
- Need to incorporate and plan for potential **mental health issues** that may arise during a response, and/or conducting a welfare cull

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16/15/2016

Zoning

If ASF is detected in Canada, the CFIA will use the *Health of Animals Act* and its Hazard Specific Plan (HSP), to declare a control zone(s) in order to contain and prevent the spread and ultimately eradicate of disease from Canada.

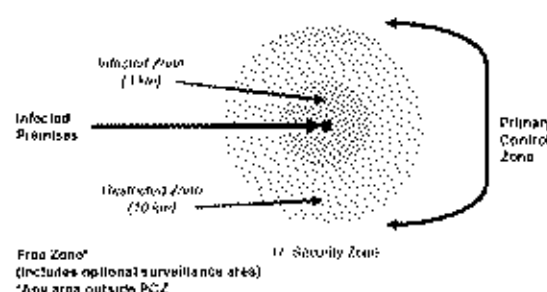
A Primary Control Zone (PCZ) will include:

- **Infected zone:** minimum of 3km from any infected premises
- **Restricted zone:** a minimum of 10 km from any infected premises

The size and number of zones will depend on the extent of the outbreak and is based on its epidemiological investigation.

CFIA will control the movement of animals and things capable of transmitting disease within and out of the zone via permitting.

Animals or products originating inside a zone generally cannot be exported.

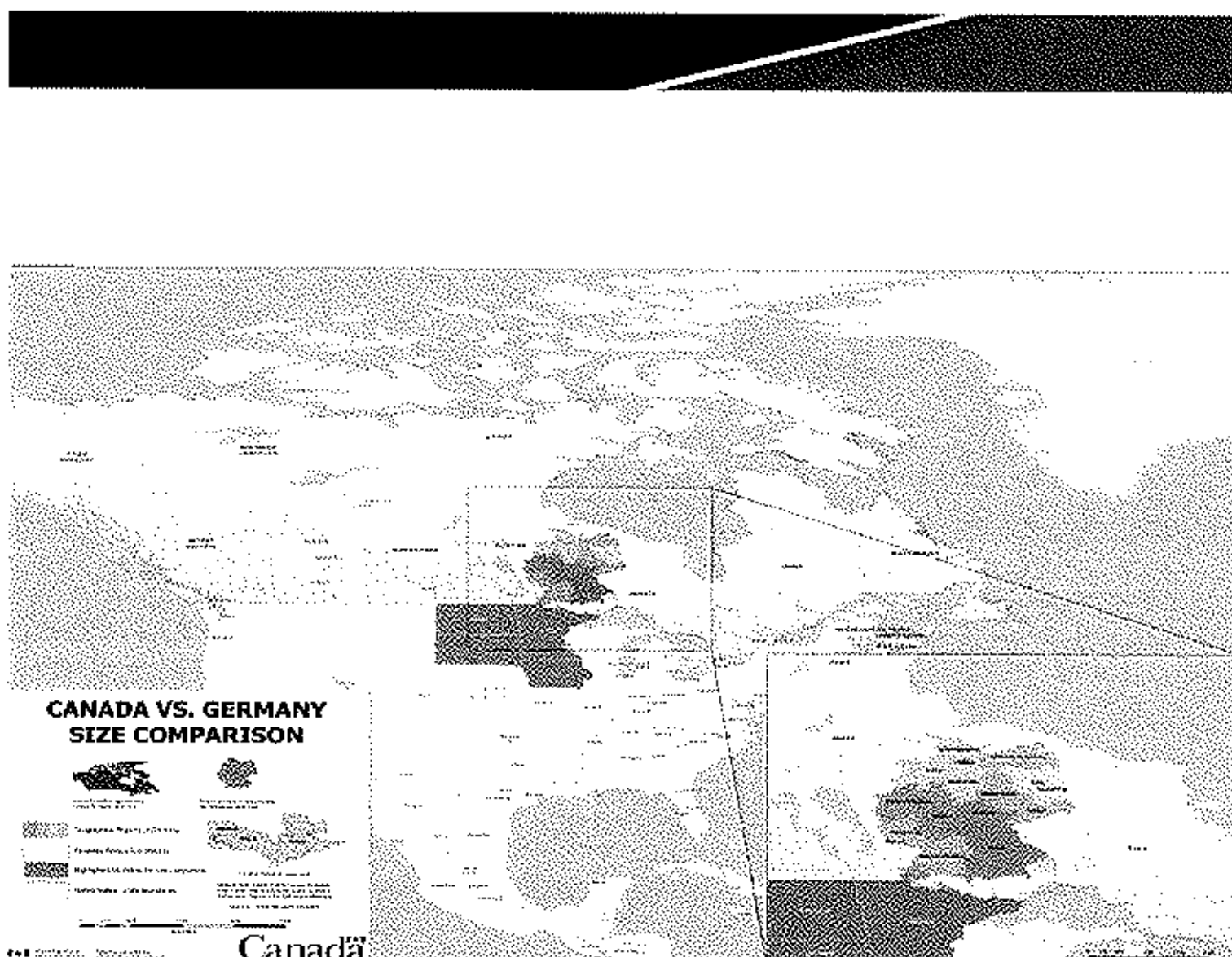


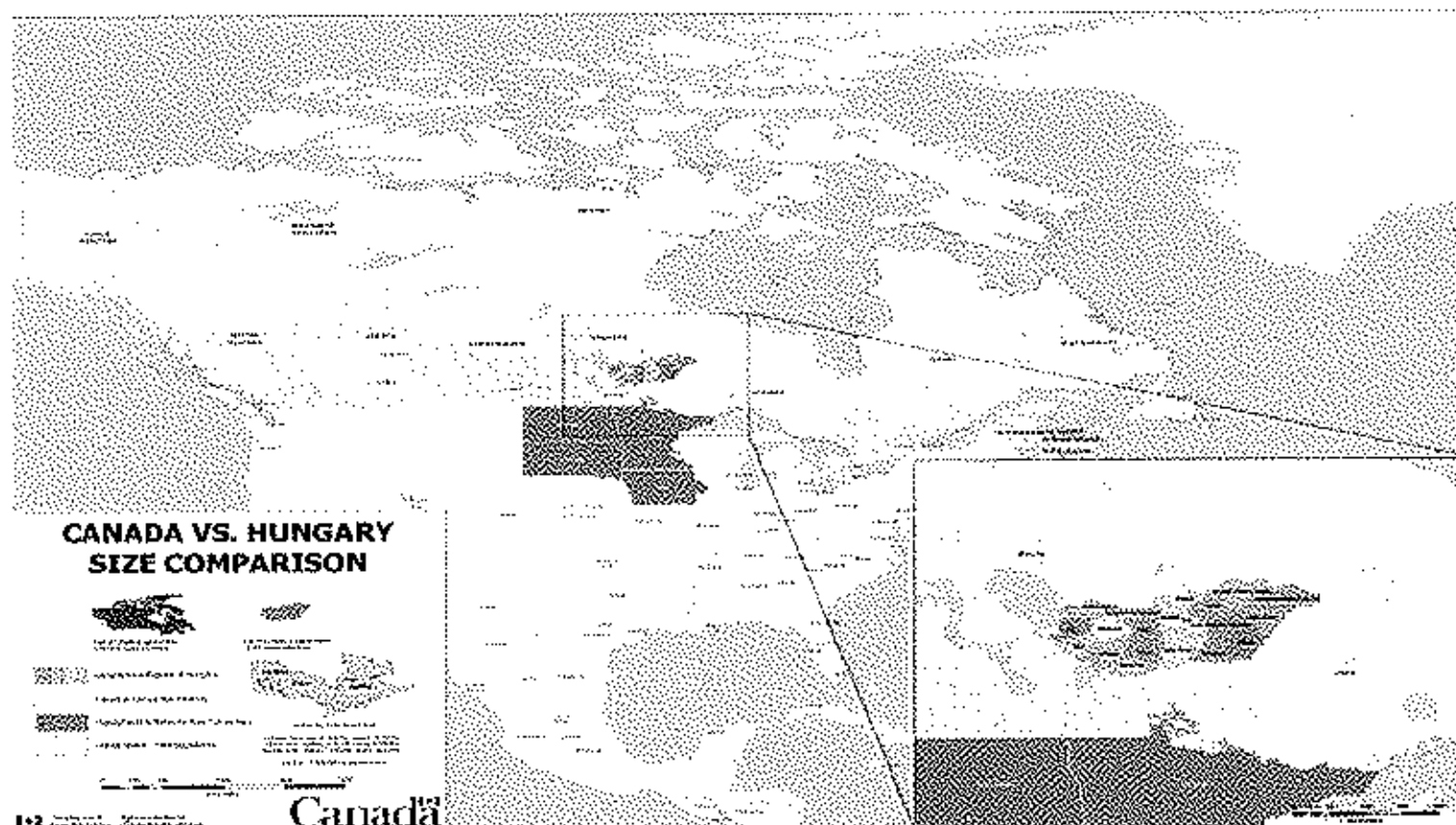
Zones are often not perfect circles, but rather use boundaries defined by identifiable landmarks (i.e. geographic, political or municipal)

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Challenges Faced by Large Countries

- Canada is 9,984,670 square kilometers in total area, making it the second largest country in the world.
- Just the province of Ontario in Canada, for example covers over 1,076,395 square kilometers and contains 49 counties.
- The province of Quebec, with its vast 1,668,000 square kilometers, is divided into 17 administrative regions, each averaging 87,789.5 square kilometers is impacted even more severely by countries only recognizing zones at the provincial level.
- Ontario and Quebec are much larger than many European countries with smaller administrative areas, such as France (551,695 square kilometers), Germany (357,592 square kilometers) or Hungary (93,030 square kilometers) and these countries have much smaller provinces or states that countries recognize for international trade during disease outbreaks.





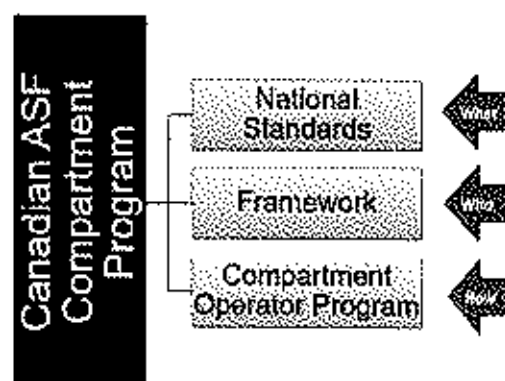
CHINA

Challenges Faced by Large Countries

- When countries do recognize zones, they often **don't recognize the actual zone but recognize an administrative region (province or state) or the whole of the country as being infected.**
- This can cause **problems for large countries** dealing with disease outbreaks when large areas are placed under **restriction disrupting trade**, and creating **long-lasting economic impacts** on industries reliant on animal exports
- Thus as the **size of a country increases**, often so does the size of the regions or the **administrative divisions (provinces or states)** within a country and therefore, the **size of the area under restrictions** imposed by countries that only regions or the administrative divisions also is much larger.

Compartments

- Canada is currently developing the world's first ASF Compartment program to support continued trade of live pigs, pork and pork products should the disease be detected in Canada.
- The Canadian ASF Compartment Program is a shared responsibility between the Canadian Food Inspection Agency (CFIA), provincial and territorial governments, the Canadian Pork Council (CPC) and hog producers.
- The CFIA published the National Standards and Framework for ASF compartments in Canada in October 2023



Trade Arrangements

The CFIA's international affairs branch has negotiated multiple trade arrangements with key trading partners:

- Zoning arrangements are in place with the U.S., EU, Singapore, Vietnam, and Hong Kong
 - These arrangements currently cover approx. 39% of Canada's pork export value
- Negotiations continue with other key trading partners including Japan, the UK, Colombia, South Korea, Chile, Mexico, Philippines and Peru

Negotiations with several other nations in the Indo Pacific and South American regions are also ongoing.

Discussions rely on an open exchange of information, including details regarding Canada's robust disease response plans built on common WOAH guidelines.

International Engagement and Support

- International cooperation is critical to ensure the control and eradication of African swine fever.
- Canada has participated in numerous forums and engagements to support the international community and individual countries efforts to prevent, prepare for and respond to ASF. These include:
 - North American ASF Forum and 2024 International Technical Cooperation Engagement Event
 - IICA ASF In person Latin American technical workshop.
 - Indo-Pacific Seminars
 - WTO Thematic Session: Regulatory approaches on the recognition of Regional Conditions
- In addition, Canada's National Centre for Foreign Animal Diseases (BSL-4) laboratory in Winnipeg, Manitoba is a WOAH reference lab working directly with multiple other countries to support diagnostics, vaccine development and other academic ASF research.

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Additional Achievements (FPTI)

- ASF Industry Preparedness Program (AAFC ASF-IPP)
 - Provided contributions to fund biosecurity assessment and improvements including wild pig management, sector analysis, communication and engagement, and research projects.
- Canadian Swine Biosecurity Guideline & Biosecurity Toolkit
 - Updated biosecurity guideline providing comprehensive guidance for producers, swine health professionals and industry partners. Toolkit includes posters and videos on biosecurity.
- Depopulation and Disposal Working group
 - Canadian Swine Depopulation Method Reference Document
 - Development and testing of humane euthanasia trailers
- Movement Control Working Group
 - Continued development and refinement of Canada's Movement control Recommendations is underway. Movement risk mitigation recommendations have been completed.
- Surplus Swine Depopulation Plan
- Coordinated Communications
 - Shared contact lists, streamlined notification pathways (intra- and inter-organization) and ASF emergency communication guide

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Emergency Management

- For over 20 years, the CFIA and response partners have utilized Incident Command System (ICS) to respond to emergencies.



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Public Communications

Canada has successfully launched multiple ASF awareness campaigns including *"Don't pack pork"* traveller advertisements which ran in Canadian airports during peak travel times.

The *"Close the Gate on ASF"* campaign and new tools such as targeted biosecurity webpages are tailored to support small-scale farmers and producers through easy-to-follow steps to keep their animals safe from disease.

CFIA has also conducted multi-year, public opinion research to track the effectiveness of these efforts.



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Next Steps

- Continued international collaboration and cooperation
- Ensuring horizontal response planning (HPAI, FMD, etc).
- Continued refinement and operationalization of the Hazard Specific Plan, and Destruction/Disposal planning.
- Support for Provincial and Industry response plans
- Mental health training and support for both emergency responders and producers

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Questions?



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Annex A

ASF EMB Top Accomplishments Under the Pan-Canadian Action Plan on African Swine Fever

<https://www.animalhealthcanada.ca/pdfs/ASF-Action-Plan-Top-Accomplishments-EN-FINAL.pdf>

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Pan-Canadian Action Plan on African swine fever:



Pillar 1: Prevention and Enhanced Biosecurity

(led by the Canadian Pork Council)

TOP ACCOMPLISHMENTS:



Canadian Swine Biosecurity Guideline

Updated biosecurity guideline outlining the latest best practices in biosecurity, providing comprehensive guidance for producers, swine health professionals, and industry partners. It includes an extensive list of recommended biosecurity measures and offers benchmark assessment tools to support ongoing on-farm biosecurity implementation.



Mandatory border training

Implemented border services officer mandatory training on the impact of African Swine Fever.



Detector dog teams

Added 22 more detector dog teams across Canada to detect unreported food, plant, and animal products that could pose a risk of introducing ASF into Canada.



Biosecurity Benchmark Tools

Biosecurity assessment tools designed to assist producers in evaluating the effectiveness of on-farm biosecurity measures, covering external, internal, and transportation biosecurity.



Canada's Invasive Wild Pig Strategy

Completed Canada's Invasive Wild Pig Strategy. The overarching document is a 10-year strategy that provides Canada-wide leadership to facilitate eradication of invasive wild pigs.



Biosecurity toolkit

Developed a Biosecurity Toolkit on the importance of implementing biosecurity measures for the prevention of ASF. Includes posters, videos on biosecurity.

Pan-Canadian Action Plan on
African swine fever:



Pillar 2: Preparedness Planning

(led by the Canadian Food
Inspection Agency)

TOP ACCOMPLISHMENTS:



CFIA's ASF-Hazard Specific Plan

CFIA's ASF-Hazard Specific Plan (ASF-HSP) is current and ready to be implemented in the event of an ASF emergency.



Tabletop exercises

Designed and facilitated 11 tabletop exercises to validate preparedness plans and response requirements, involving government and industry.



Large-scale, multi- stakeholder exercise

AFC organized a large-scale, multi-stakeholder exercise for November 2024 to work through key elements of the ASF response.



Integrated Emergency Response Plan Framework for ASF

Developed the Integrated Emergency Response Plan (IEP) Framework for ASF and the associated gaps report.



CanSpotASF Surveillance Program

Created the CanSpotASF program, an early detection surveillance program for ASF in Canada.

- Risk-based early detection testing at approved laboratories
- Risk-based early detection confirmation testing at abattoirs
- A web app surveillance tool launched in July 2024



Canadian Swine Depopulation Method Reference document

Updated the Canadian Swine Depopulation Method Reference document.



Movement Risk Mitigation Recommendations

Updated the Movement Risk Mitigation Recommendations in an ASF situation in Canada.



Pan-Canadian Action Plan on
African swine fever:



Pillar 3: Ensuring Business Continuity

(led by the Canadian Meat Council)

TOP ACCOMPLISHMENTS:



ASF zoning standards

Established ASF zoning standards and shared requirements with FRI stakeholders. Zoning standards are outlined in the CFIA HSP for ASF.



Compartmentalization Program

The groundwork for creating a national ASF compartmentalization program is complete, providing a solid foundation for moving ahead with implementation.



Model for Shared Costs

Initiated the development of a Model for Shared Costs in the Event of Foreign Animal Disease Outbreak.



AAFC's African Swine Fever Industry Preparedness Program

Establishes the funding program to support the industry in addressing gaps in prevention and mitigation efforts, and for the tests, partnerships, and activities to ensure early detection and effective emergency response.



Surplus Swine Depopulation Plan

The Hog Supply Working Group, comprised of federal/provincial/municipal governments, and in July, developed the Surplus Swine Depopulation Plan, and included additional surplus hog resources options that take into consideration all segments of the pork supply chain.



Pan-Canadian Action Plan on African swine fever:



Pillar 4: Coordinated Risk Communications

(led by the Ontario Ministry of
Agriculture, Food & Agribusiness)

TOP ACCOMPLISHMENTS:



Information flow

Created a notification pathway to map the information flow process from African swine fever suspicion to 24 hours post announcement to sign on points of accountability and dependencies between organizations



ASF Emergency Communication Guide

An ASF Emergency Communication Guide is under development to ensure ASF prevention messaging is consistent among FHI stakeholders



Contact list

Established communication contact lists, shared and regularly updated



Traveller awareness campaign

Created Great Park Park traveller awareness campaign to help prevent African swine fever entry into Canada



Communications resources for project/ programs

Developed and shared resources on topics such as:

- Producer awareness and biosecurity
- Food safety awareness
- Emergency response /communications logistics



AnimalHealthCanada

Learn more: animalhealthcanada.ca/african-swine-fever

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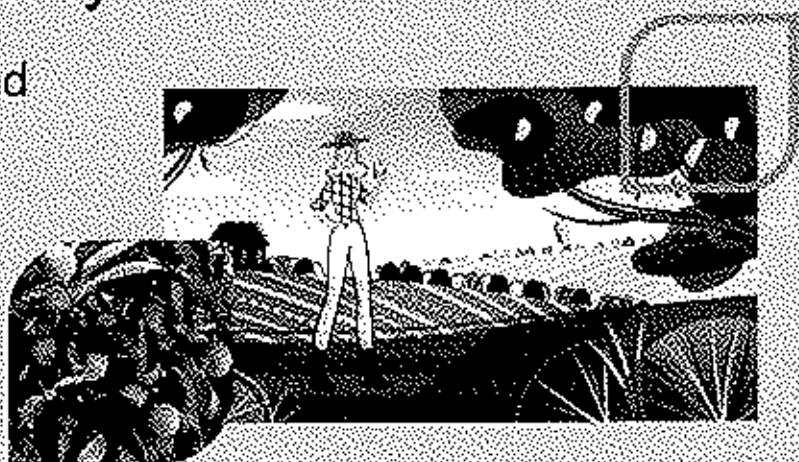
Regulating phytosanitary irradiation

Exploring opportunities and challenges

April 2025

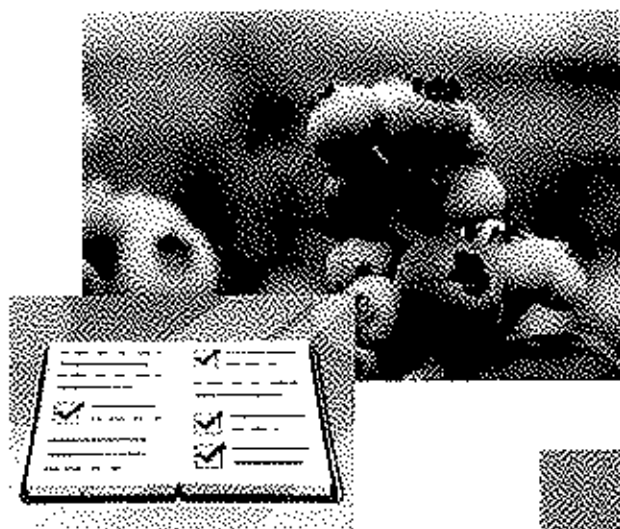
Tash Voysey

Market Coordination and Strategy / Biosecurity Plant & Science Services Division



Presentation Topics

- Who we are
- Changing regulatory landscape
- Benefits of phytosanitary irradiation
- Appropriate regulation
- Challenges and opportunities
- Take home messages



Department of Agriculture, Fisheries and Forestry (DAFF)

- Australia's National Plant Protection Organisation (NPPO) responsible for:
 - Managing biosecurity risks to Australia
 - Negotiating trade conditions
- Biosecurity Plant and Science Services Division
 - Negotiating trade conditions for plant products – import and export
 - Regulating import and export pathways
 - Strategic policy supporting plant trade into the future



Australian Government

**Department of Agriculture,
Fisheries and Forestry**

Increasingly Complex Regulatory Environment

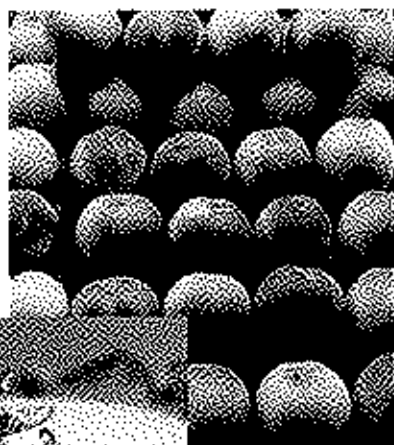


- Growing trade
- More trade = More risk
- Changing consumer and political expectations
- Changing regulatory environment
- Changing pest pressures
- Production pressures

**Key Priority = Maintain existing trade
Futureproof trade**

Benefits

- Effective treatment - helps DAFF meet obligations as the NPPO for import and export
- Pest-specific doses
- Wide range of commodities and pests
- Sustainability credentials
- Alternative to traditionally used ag chemistries



What underpins our confidence in irradiation?



Research on dose efficacy



Product security



Confidence that the dose will be correctly delivered to the product

Regulatory oversight

- International standards and frameworks (ISPMs)
- Exports
 - Oversight of facilities
 - Standards for routine treatments
 - Frameworks for export inspection
- Imports
 - On arrival frameworks to clear produce at the border
 - Confidence in exporting NPPO's regulation of their facilities



Food and Agriculture Organization of the United Nations

International Plant Protection Convention



Requirements for the use of irradiation as a phytosanitary measure

Food and Agriculture Organization of the United Nations

Importance of regulation

- Sterility – importing country needs confidence the treatment has been applied correctly
- Exporters need confidence irradiated produce will be cleared on arrival.
- Relatively new phytosanitary treatment – supporting uptake to achieve most benefit from investment in the treatment
- Appropriate regulation: over-regulation vs under-regulation

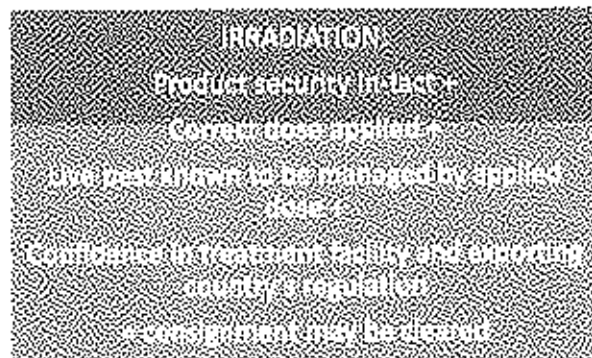
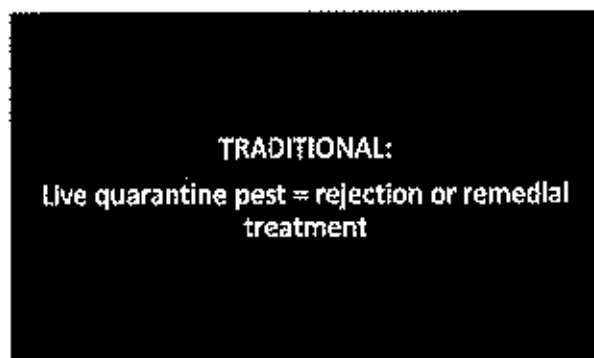
Food and Agriculture Organization of the United Nations

Australian phytosanitary treatment application standard for irradiation treatment



Challenge: sterility in import clearance processes

Sterility a relatively new concept for trade.



Giving border staff the tools (frameworks) to clear irradiated consignments

Challenge: over-regulation vs under-regulation



- Setting requirements that:
 - give assurance to both the importing and exporting country
 - allow flexibility for industry
 - ensure the treatment remains viable
- Importance of international standards e.g. ISPMs

Opportunities

Research

- Understand knowledge gaps
- Additional ISPMs for pests such as mites
- Quality implications

Education

- Develop education and communication tools
- Irradiation Insights Education Package



Partnerships

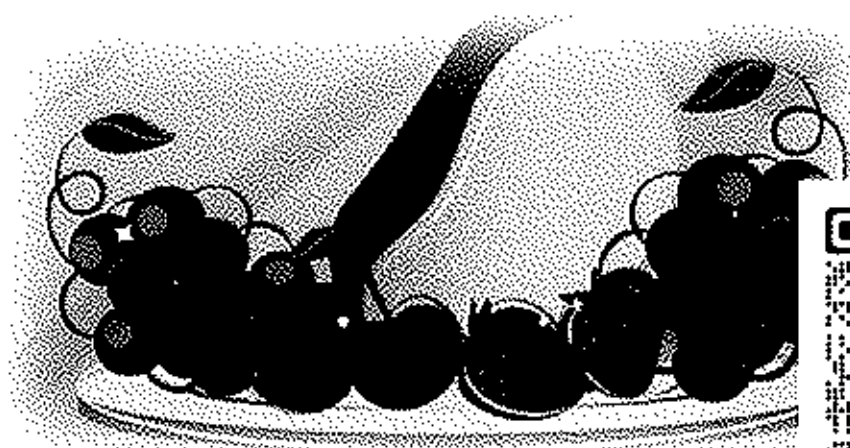
- Promote two-way trade
- Trading partner engagement and cooperation
- Research partnerships and collaboration
- Develop local relationships

Key messages

- Irradiation is an important tool for trade - more phytosanitary treatment options is better for NPPOs and industry
- Innovative biosecurity treatments require evolving our approach to regulation
- Irradiation success is contingent on both countries having appropriate regulatory frameworks
- NPPOs to work together to overcome challenges and utilize opportunities



Thank You



Tash Voysey
Tash.voysey@aff.gov.au



Check out our Irradiation Insights
education package

Exploring Ethyl formate as a Quarantine Treatment for Fresh Fruits : Findings from Initial Trials

Ms. JHANG Yu-Ling

Animal and Plant Health Inspection Agency (APHIA)

MAY 2, 2025

2025 QRM



農業部動植物防疫檢疫署
ANIMAL AND PLANT HEALTH INSPECTION AGENCY
MINISTRY OF AGRICULTURE

1

Outline

- Introduction
- Ethyl Formate Initial Trials on Fruits
- Findings

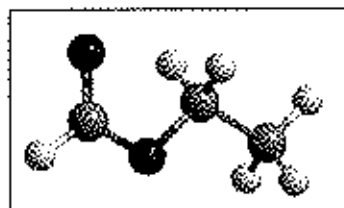


農業部動植物防疫檢疫署
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MINISTRY OF AGRICULTURE

Ethyl formate

Methyl bromide

- No MRL requirement
- Not classified as a Regulated Toxic Chemical by EPA
- Sustainable and ozone-friendly fumigant
- High safety profile
- Effective against common quarantine pests
- Short fumigation time
- Low equipment modification cost
- Commercially available formulation



CAS Reg. No.	109-94-4
Molar mass	74.08 g/mol
Formula	C ₃ H ₆ O ₂
Appearance	Colorless liquid
Boiling point	54°C
Water solubility	88 g/L

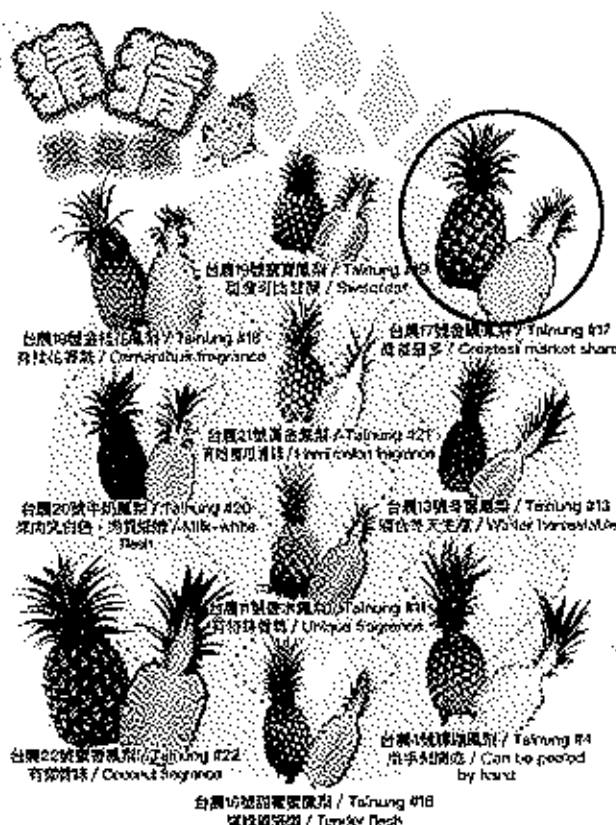


農業部動植物防疫所
ANIMAL AND PLANT QUARANTINE AGENCY
MINISTRY OF AGRICULTURE

1

Pineapples

- An important tropical fruit in Taiwan for domestic market and export (Japan).
- About 9,335 ha/year, 400,000 metric tons of fruits in Pingtung, Tainan, Kaohsiung, Chiayi and Nantou.



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Pineapples

- Cultivar : Tainung 17 (brand name : 金鑽 'Golden Diamond')
- Harvest season : Feb-May, Oct-Nov
- Target Pest : Cosmopterigidae (larvae)



normal



Cosmopterigidae larva infected



Xiashong District Agricultural Research and Extension Station, MOA



農業部植物防疫檢疫署
MINISTRY OF AGRICULTURE, REPUBLIC OF CHINA (TAIWAN)

5

Sugar apples

- Atemoya
(*Annona cherimola* x *Annona squamosa*)
- Harvest season : Jan-Mar, Jul-Aug
- Rich in vitamins, minerals, and other essential nutrients

Taiwan ATEMOYA
A fruit more than delicious

The pulp of the Atemoya is as white as snow with a delicate, slightly al dente texture. Its sweet taste is complemented with just a hint of sour, giving it an absolutely characteristic taste of the tropics. It is also rich in vitamins, minerals, proteins, and dietary fiber.

Minerals and electrolytes
Calcium, phosphorus, magnesium, and potassium are key elements for maintaining cardiovascular health. They help in maintaining the normal operation of the heart, muscles, and nerves.

Crude Protein

Vit. B2

Dietary fiber
Dietary fiber becomes the nucleus of stool within the body, promoting gastrointestinal peristalsis. This is particularly important for people who are sedentary or have a diet low in fiber.

Vitamin C
Promotes the formation of collagen particles which help maintain skin elasticity and firmness, and serve as antioxidant.

Protein and vitamin B2
Protein, made up of amino acids, is an important component in the structure of human cells. Vitamin B2 helps restore energy for proper metabolism so that the heart and nervous system can work normally. Vitamin B2 also helps preserve the body's health.

© Cosmopterigidae larvae on Atemoya and Apple are listed as a pest by the MOA.

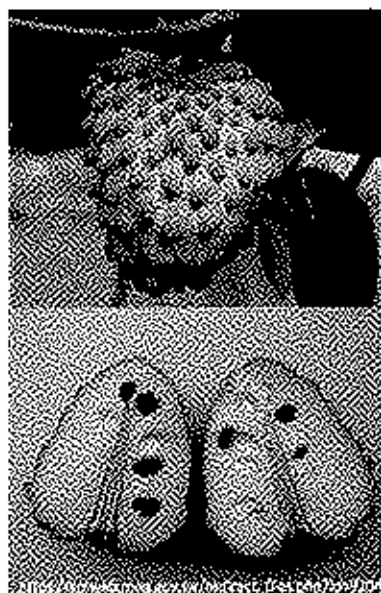
https://www.tdiars.gov.tw/theme_data.php?theme=news&sub_theme=news&id=6940



農業部植物防疫檢疫署
MINISTRY OF AGRICULTURE, REPUBLIC OF CHINA (TAIWAN)

Sugar apples

- Target Pest : *Planococcus minor*



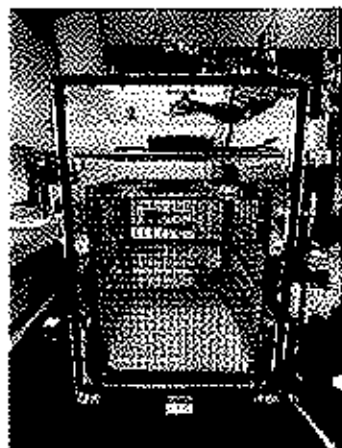
農林部動植物防疫所
NATIONAL PLANT QUARANTINE SERVICE
MINISTRY OF AGRICULTURE

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Initial trials setting

1. Small Acrylic Box (0.04m³)

- Ethyl formate (420g/m³) fully volatilize in 1 minute
- More cost-effective way of full-load simulation trials

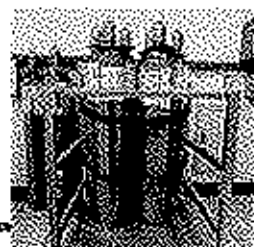


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Initial trials setting

2. Fumigation Chamber (14.3m³)

- 16.7% ethyl formate + 83.3% balance carbon dioxide
- Commercialized ethyl formate imported from AU
- Fumigation chamber is approved by AU technician

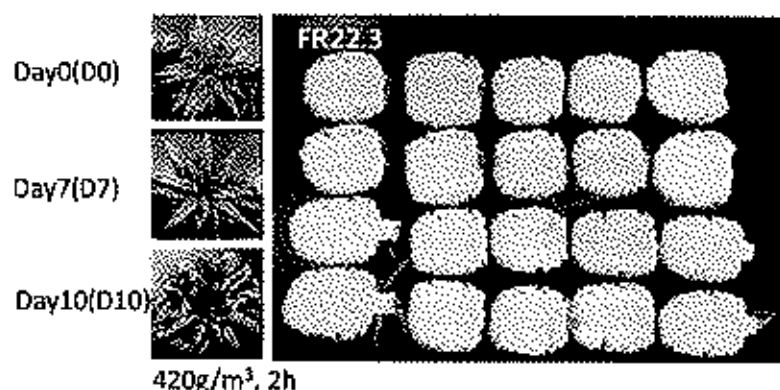


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Results-pineapples

- 310g/m³ treated for 1hr : 100% mortality of Cosmopterigidae larvae
- No effect on flesh, peel and taste
- Leaf tips of crown is bleaching and scorching; increased severity over time
- Crown injury occurred regardless of fruit location or filling ratio(FR)



CK 210 g/m³ 310 g/m³
D0



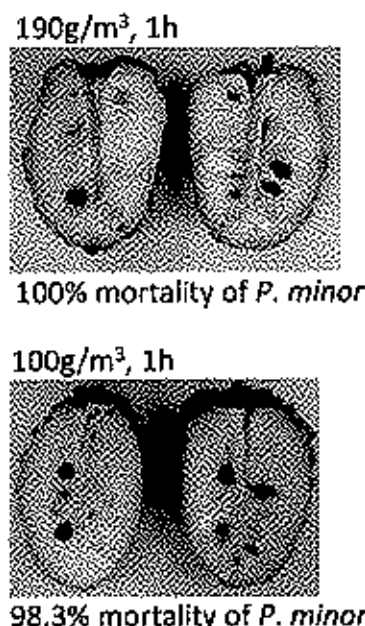
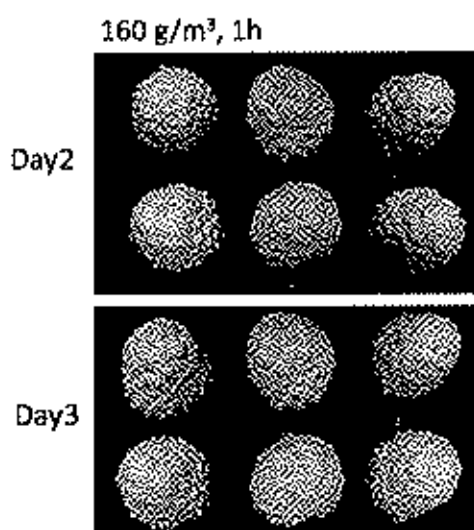
CK 210 g/m³ 310 g/m³
D10 : crown bud wilting



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Results-sugar apples (atemoya)

- 190g/m³ treated for 1hr : 100% mortality of *Planococcus minor*
- No effect on flesh, peel and quality



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Findings

Conclusion

ethyl formate has the benefit of assisting with pest elimination

Limitations/ Challenges

- cost of commercial ethyl formate
- concentrated harvest season for fruits
- need to simulate the long-term storage and transportation
- treatment baseline for pineapples causes damage on crown
- no treatment baseline for atemoya
- circulation space for ethyl formate

Future perspectives

clear treatment standards (filling ratio, adsorption properties) are needed



Questions?



675411-1 Glycerol



夏部郵政運輸部度所決事

1996. *Journal of the American Veterinary Medical Association*, 160: 1547-1551.

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Hitchhiker Pest Surveillance beyond the Australian Border

2 May 2025

Dr. Andrew Tomkins
Department of Agriculture, Fisheries and Forestry, Australia



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Hitchhiker Pests

- "A pest carried by a commodity, packaging, conveyance or container, or is present in a storage place and, in the case of plants and plant products, does not infest them" (IPPC, 2010 – *refers to contaminating pest).
- Can 'hitch a ride' to Australia within or on shipping containers, imported goods and other forms of transportation.
- Are not native to Australia and their establishment could threaten Australia's agricultural industries, economy, environment and way of life.
- Include exotic bees, snails, stink bugs, moths and timber pests which are listed as National Priority Plant Pests.



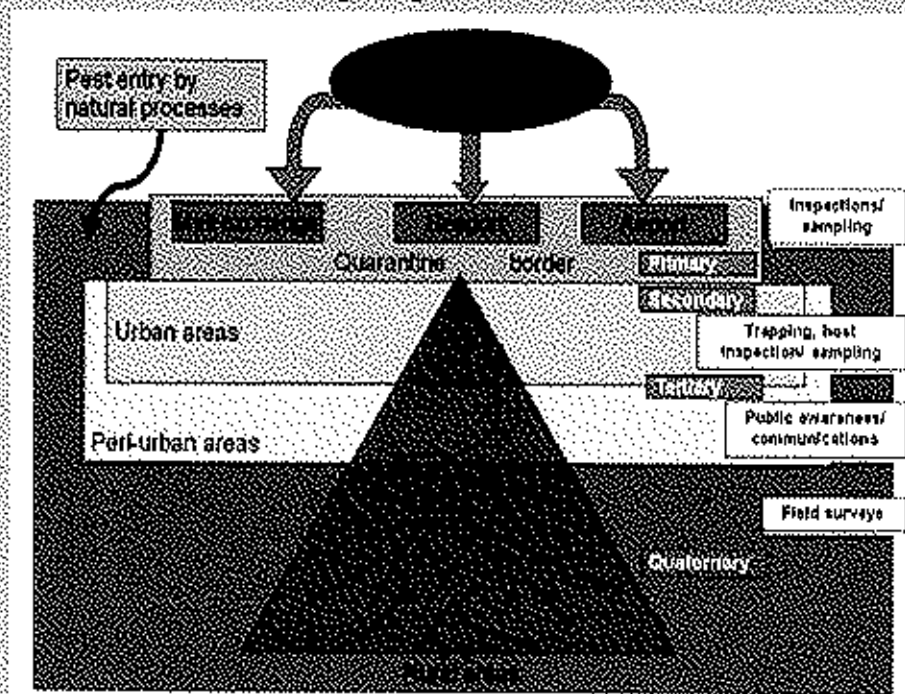
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Australia's plant biosecurity system

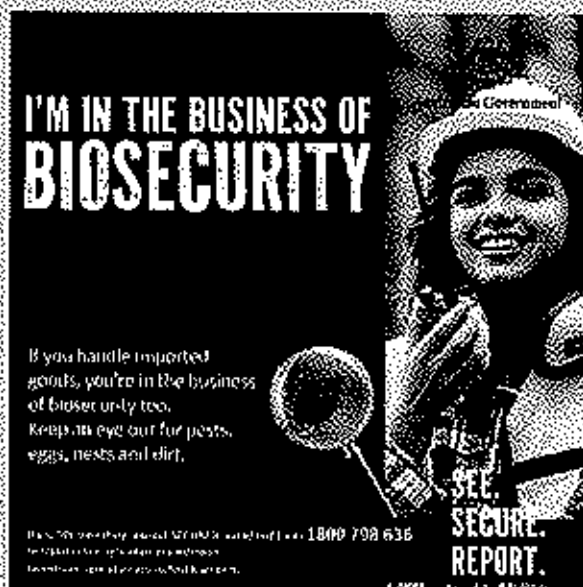
Australia maintains a comprehensive plant biosecurity system from the border to the farm level to prevent entry, establishment and spread of hitchhiker pests.



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Regulation of hitchhiker pests in Australia

- Australia enforces strong regulatory procedures on imported goods that prevent entry, establishment and spread of hitchhiker pests.
- The *Biosecurity Act (2015)* is our key legislation that facilitates the regulation of exotic hitchhiker pest entry and establishment in Australia.
- Department of Agriculture, Fisheries and Forestry (DAFF) plays a major role in implementing import regulation:
 - Imposes import conditions such as offshore treatments and controls including container cleanliness.
 - applies strict quarantine measures at the international border including inspections and treatments.



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Surveillance complements regulation

- Hitchhiker pests can be quite cryptic and less active when they arrive, hampering their detection at the Australian border, which might enable their entry through the border.
- Surveillance at and near border is vital for early detection of hitchhiker pests, to enable response preventing their establishment and spread.



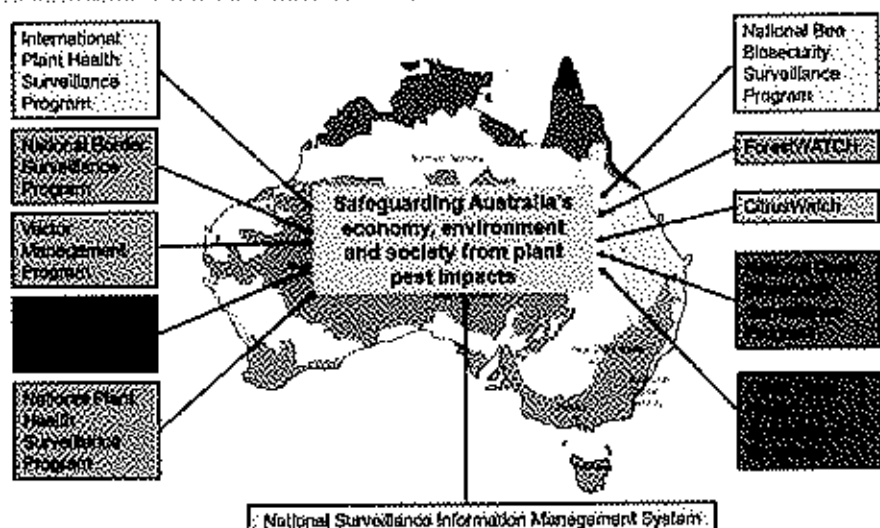
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Hitchhiker pest surveillance in Australia

- Australia maintains a seamless national biosecurity surveillance system focused on early detection of hitchhiker pests.
- DAFF delivers/facilitates key surveillance programs across the biosecurity continuum (offshore, at the border and near border areas).
- **Hitchhiker Surveillance Program** is the key initiative targeting hitchhiker pests.



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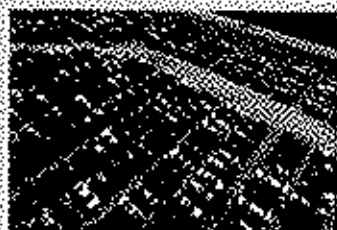
Hitchhiker Surveillance Program

- Hitchhiker Surveillance Program (HSP) conducts surveillance for hitchhikers at near border areas.
- HSP focuses on sites where imported goods are handled after having been released on documentary evidence.
- These goods may pose a risk of introduction of certain hitchhiker pest species especially through conveyance and packing material associated with them.



Surveillance focused on high-risk importer sites

- ❖ **Tile & stone importers**
 - Businesses receiving, unpacking, and storing imported tiles and other landscaping materials.
- ❖ **Imported wooden pallet recyclers**
 - Businesses holding, recycling, reconditioning and/or disposing of used imported wooden pallets.
- ❖ **New vehicle importers**
 - Yards where new vehicles are held and prepared before sale after unloading from ships.



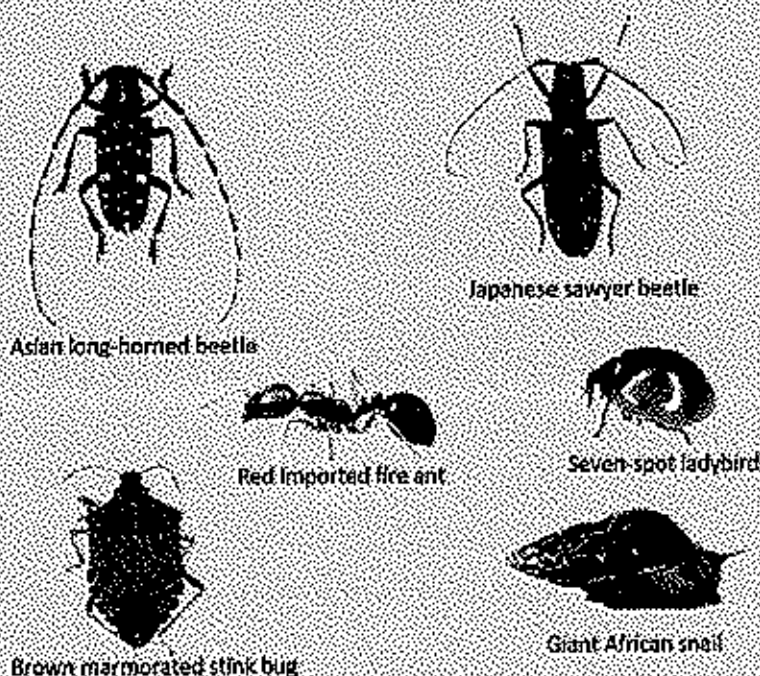
Rationale for targeting high-risk importer sites

- International evidence shows that some Imported goods are major pathways for hitchhiker pest entry (Allen 1998; Brenton-Rule *et al.* 2018; Eyre and Haack 2017; Eyre *et al.* 2018; Haack 2006; McCullough *et al.* 2006; Zhao *et al.* 2021)
- For example:
 - Imported wooden packaging material – is a source of increasing numbers of pests. For example, between 2013-16 imported wooden packaging material arriving at 9 major Chinese ports had:
 - 459,341 pests,
 - 53% of which were insect species, and
 - Included mites, snails, weeds and nematodes (Zhao *et al.* 2021).
 - Imported vehicles – have increasing numbers of post-border detections of live organisms (Fernando *et al.* 2006).

HSP targets

Sixty-nine high-risk Importer sites are surveyed across four Australian states targeting national priority hitchhiker pest species:

- *Anoplophora* beetles
- Invasive ants
- Invasive snails
- Ladybird beetles
- Sawyer beetles (*Monochamus* spp.)
- Shield bugs (i.e. BMSB)



Types of surveillance

Trapping

- Trapping is conducted fortnightly using pheromone-baited panel traps (P333+ attractants lure, Alpha Pinene, BMSB DUAL LURE (High Load)).
- Specimens are collected in propylene glycol for identification.
- BMSB and *Monochamus* spp. are targeted.



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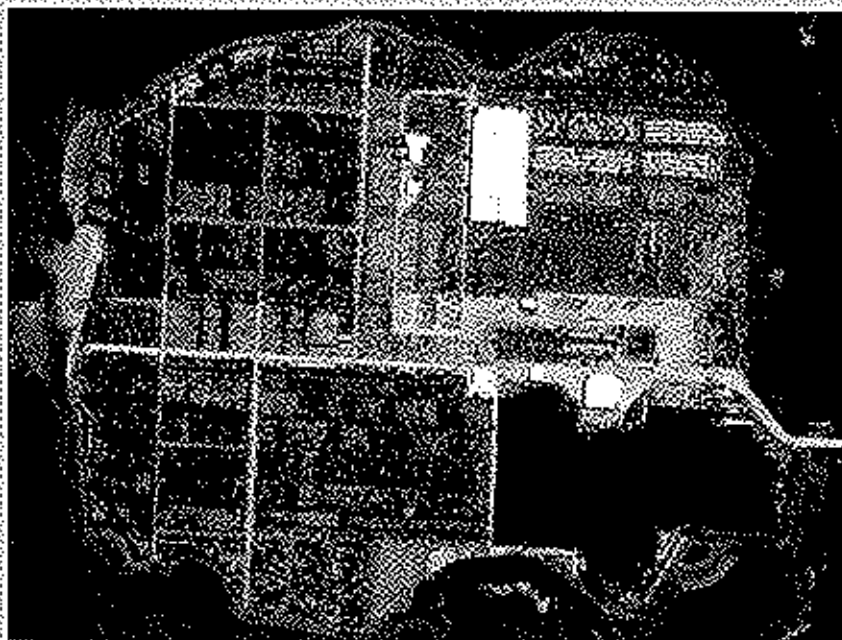
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Types of surveillance

Intensive surveillance

- One intensive surveillance round is conducted per site in spring, summer and autumn targeting exotic ants and snails.
- All imported goods in premises and hosts in the surroundings are also visually inspected.



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Managing pest detections

- HSP has made more than 30 detections, involving 10 species of hitchhiker pests between September 2024 to March 2025.
- These near border pest detections were successfully managed by implementing nationally agreed response procedures in association with the relevant state authorities.
- Australia's Emergency Plant Pest Response Deed (EPPRD) and National Environmental Biosecurity Response Agreement (NEBRA) provide nationally consistent guidance to manage responses.



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Outcomes

- Provided important information on hitchhiker entry pathways for decision making to mitigate the threat.
- Identified opportunities to further improve the national surveillance system related to import pathways.
- Confirmed the effectiveness of surveillance methods used (i.e. trapping for BMSB).
- Recognised the importance of national consistency in surveillance and diagnostic approach and stakeholder collaboration for achieving biosecurity outcomes.
- Enhanced stakeholder knowledge of biosecurity and their willingness to participate in biosecurity management.



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Australian Government
Department of Agriculture,
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BIOSECURITY INNOVATION

A Future Ready Focus

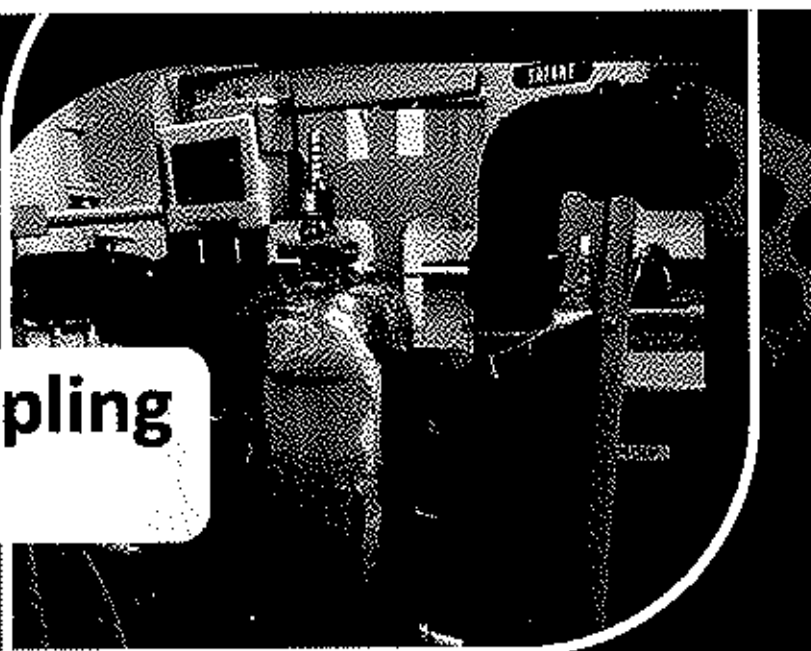
Research and Innovation

Biosecurity Operations and Compliance Group



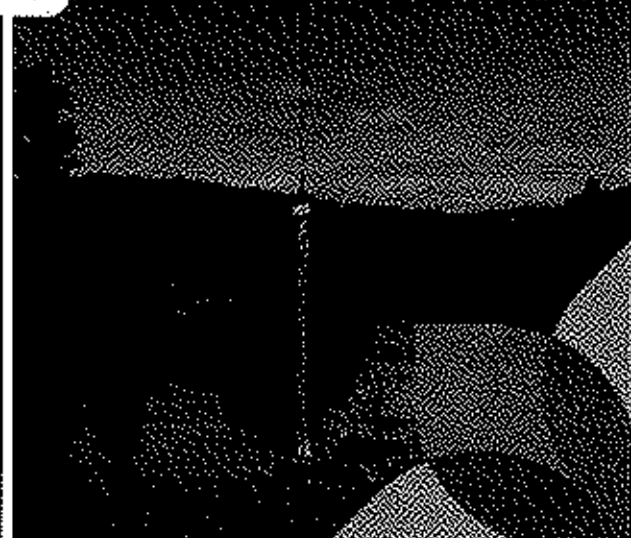
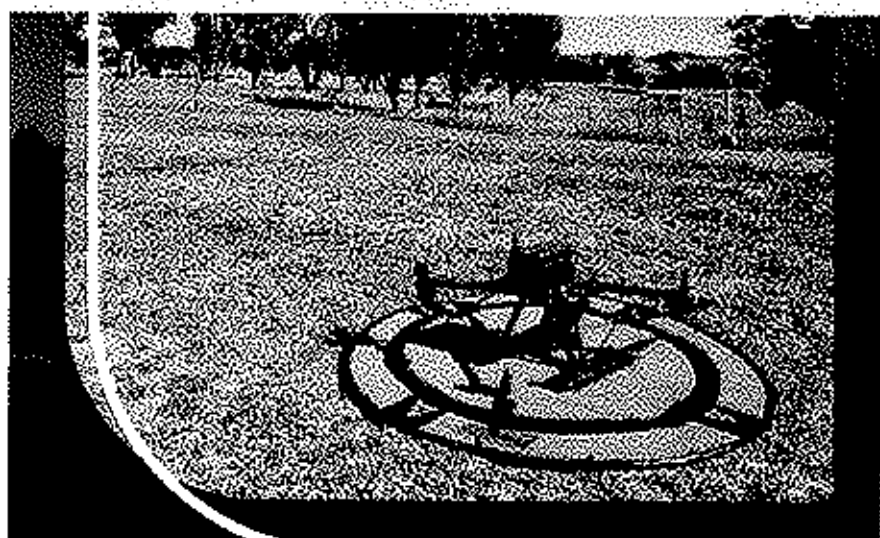
Ballast water sampling and analysis

Testing functionality of ballast water sampling & analysis kits to meet International Maritime Organisation standards.



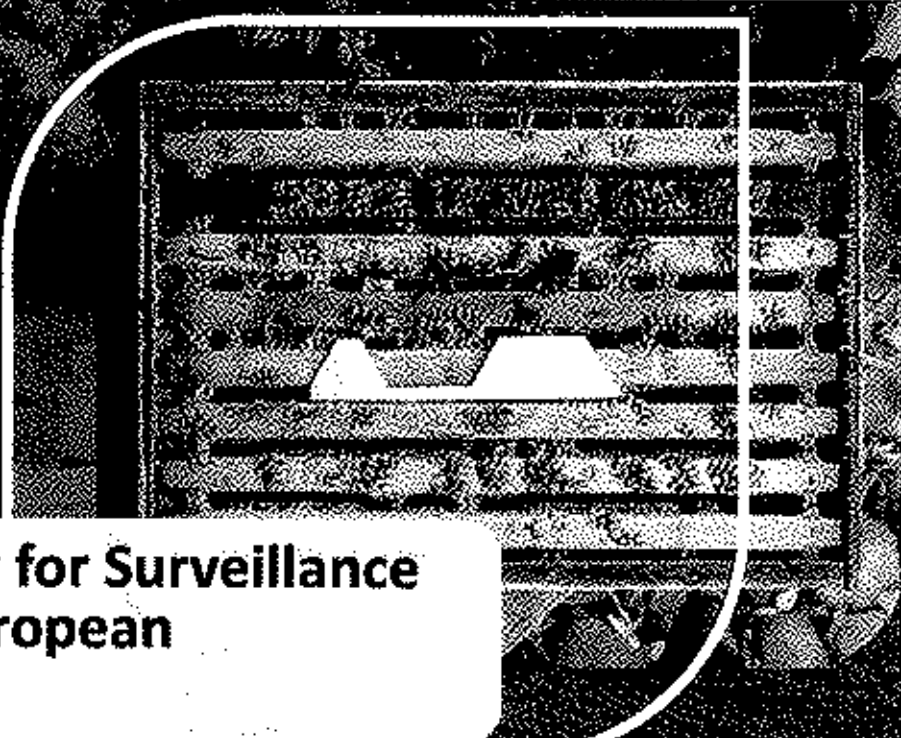
Drones collecting eDNA samples from bodies of water using a HydraSleeve water sampler.

Aerial drone and eDNA



Strengthening Australia's ability to detect exotic mites at the border and empower beekeepers to harness technology to help manage Varroa mite.

Advanced Technology for Surveillance and Monitoring of European Honeybee Mites





Aircraft disinsection

Callington will test their new residual aerosol aircraft disinsection spray within a Qantas flight for an 8-week trial period.



Stable Wizard

Stable Wizard is a cloud-centric platform that delivers all data, support, and performance in one place.



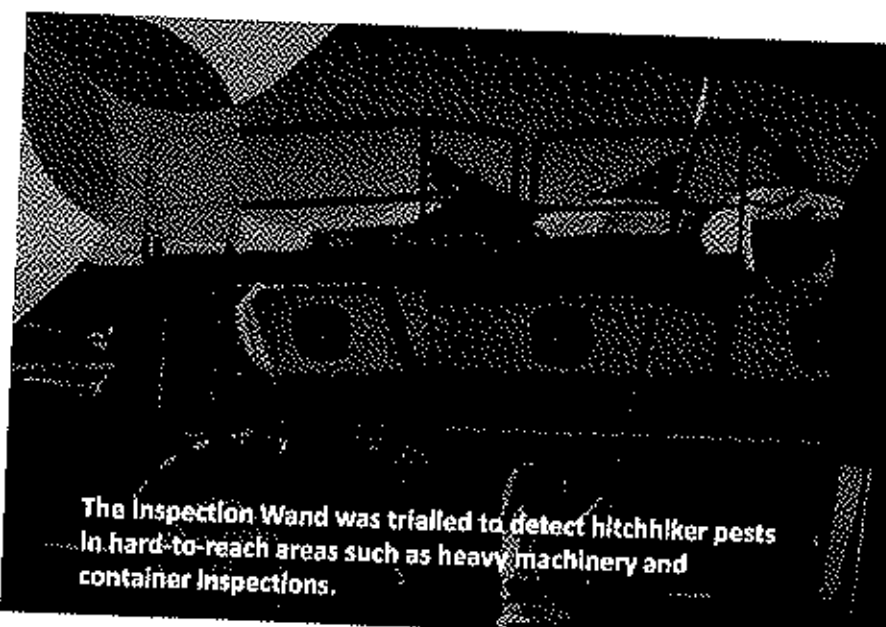
Ethyl Formate for Khapra beetle

Collaboration with Murdoch University to explore the efficacy of Ethyl formate for the treatment of Khapra beetle in India.



Light Traps

Conducted a project with Murdoch University to test the efficacy of light traps inside shipping containers to capture flying exotic pests.



The Inspection Wand was trialled to detect hitchhiker pests in hard-to-reach areas such as heavy machinery and container inspections.

Inspection wand

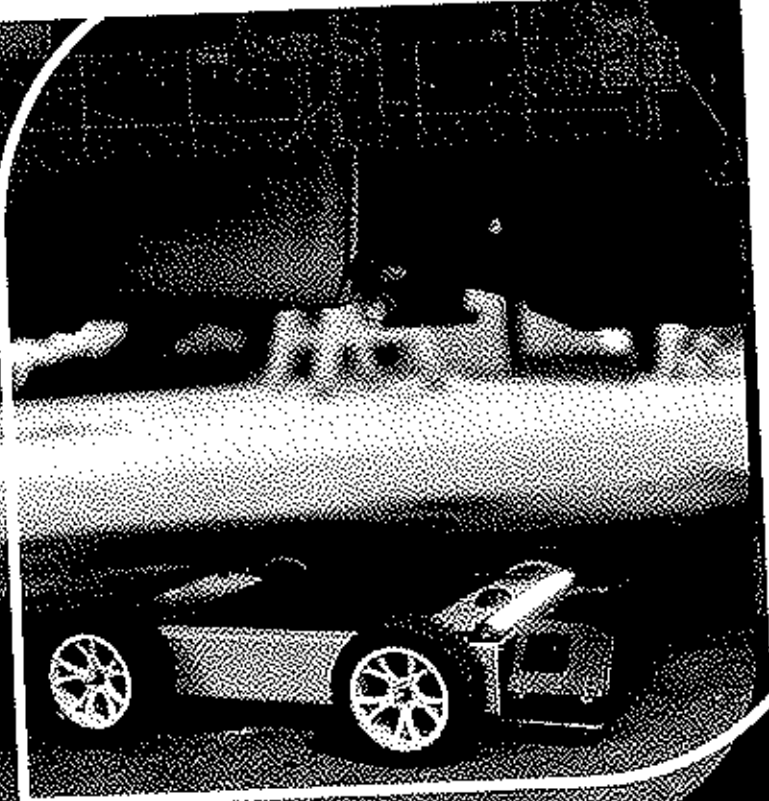


Fumigation detection

Currently trialling two new devices (MIST and FINO) to check for the presence of fumigant gasses or chemicals.

Hades

Hades is a small remote-control vehicle that houses a camera which can be used to scan the inside of a container or under a vehicle.



Spot and AI

Spot is an agile robot designed as an inspection tool to assist biosecurity officers, which enables them to undertake inspections more safely and efficiently.





Australian Government
Department of Agriculture,
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Contact us

innovationpilots@aff.gov.au



SEA CONTAINER SURVEY OF THE PHILIPPINES: AN OVERVIEW

May 02, 2025

ARNOLD S. DELA CRUZ, JR.
Supervising Agriculturist

Manila: Bureau of Plant Industry, Department of Agriculture



BUREAU OF PLANT INDUSTRY- NATIONAL PLANT QUARANTINE SERVICES DIVISION (BPI-NPQSD)

ISSUANCE DATE: OCTOBER 09, 2023
CONTROL NO. BPI/MS-RMY-714
REVISION 01.0

Bureau of Plant Industry



- The **Bureau of Plant Industry (BPI)** is one of the agencies under the **Department of Agriculture (DA)** committed to serve its stakeholders through ensuring availability of high-quality seeds and planting materials, generating innovative farming technologies, managing pests and diseases, preventing the introduction and spread of quarantine pests, and ensuring food safety.

OFFICES UNDER BPI

Research and Development

- Agricultural Engineering Division (AED)
- Crop Research and Production Support Division (CRPSD)
- Crop Pest Management Division (CPMD)

Regulatory

- National Plant Quarantine Services Division (NPQSD)
- National Seed Quality Control Services Division (NSQCS)
- Plant Product Safety Services Division (PPSSD)

National Crop Research and Production Support Centers

- Baguio National Crop Research, Development and Production Support Center
- Davao National Crop Research, Development and Production Support Center
- Guimaras National Crop Research, Development and Production Support Center
- Los Baños National Crop Research, Development and Production Support Center
- La Granja National Crop Research, Development and Production Support Center

- National Seed Industry Council (NSIC)
- Biotechnology Office
- Administration Offices

NATIONAL PLANT QUARANTINE SERVICES DIVISION (NPQSD)

- The NPQSD under the BPI, is the Regulatory arm of the Philippine Department of Agriculture when it comes to matters of import, export and domestic movement as well as market access of plants and plant products.
- Enforced by virtue of PRESIDENTIAL DECREE 1433 otherwise known as the Plant Quarantine Law of 1978, as amended.

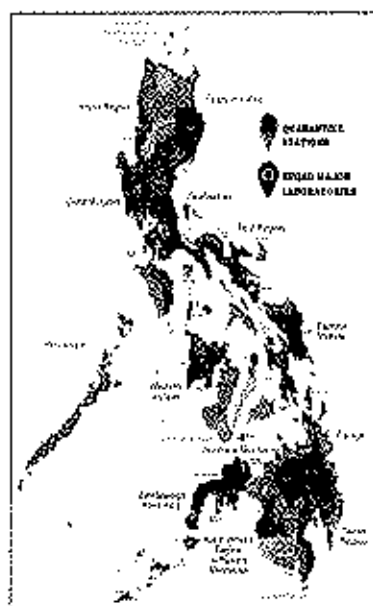


NPQSD MANDATE

- Prevent the introduction of foreign/ exotic pests into the country
- Prevent further spread of pests already existing in the country
- Facilitate trade (export) of plant products by complying with the phytosanitary requirements of importing countries



NPQSD STATIONS



23 NPQS stations and
12 sub-stations with:


- 47 international and domestic airports
- 147 international and domestic seaports
- 76 sub-ports

POWER AND DUTIES OF A PLANT QUARANTINE OFFICER

- To inspect all carriers, crew/passenger luggage and incoming mails
- To enter into and inspect any all areas where plants, plant products, and other materials capable of harboring plant pest
- To examine imported plants, plant products and other materials capable of harboring plant pests, as well as potential animal pests and to administer measures to ensure effective implementation of the provisions of this Decree
- To inspect; administer treatment, if necessary; and issue phytosanitary certificates on plants, plant products and other related materials intended for export, if the importing country so requires
- To confiscate and destroy or refuse entry of plant products and potential animal pest involved in prohibited importations, as well as prohibited plants and plant products involve in domestic movement and to deny phytosanitary certification of plants and plant products which is exportation is, likewise, prohibited
- To perform such other related duties which maybe assigned , from time to time

INTERNATIONAL PLANT PROTECTION CONVENTION (IPPC)

INSPECTIVITY 35ATP-DC COMAR (3), 4023
CONTROL NO. 019-QMS-RMT-P11
REVISION NO. 0



International Plant Protection Convention (IPPC)

- Almost every country in the world have ratified the **International Plant Protection Convention**, the global international treaty relating to plant health- to ensure **common and effective action**, to prevent **the introduction and spread of plant pest**, and facilitate **safe trade**
- It also recognizes the **phytosanitary certification system** and associated phytosanitary certificate (PC) as instruments to ensure that exported commodity are in compliance with the import requirements of countries concerned.
- On 1952, Philippines ratified the IPPC, and the **BUREAU OF PLANT INDUSTRY** as the **National Plant Protection Organization (NPPO)**.

Source: FAO eLearning Academy



NATIONAL PLANT PROTECTION ORGANIZATION (NPPO)

- To protect plant resources (including cultivated, wild and aquatic plants) through implementation of appropriate phytosanitary measures
- To support national food security and a healthy environment through effective pest exclusion procedures
- To facilitate market access and safe international trade in agricultural commodities by establishing effective phytosanitary certification systems and procedures.



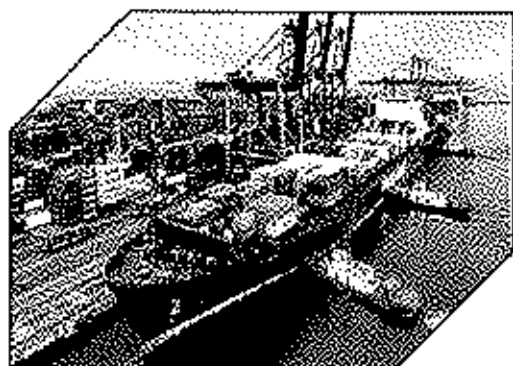
COMMISSION ON PHYTOSANITARY MEASURES (CPM)

- Is the statutory body of the **Food and Agriculture Organization (FAO)** governing the implementation of the IPPC
- It identifies **action to control the spread of pest** into new areas
- Develops and adopts **international plant health standards and recommendation** to harmonize international trade
- **Assists countries in the implementation** of those actions and standards

Source: *FAO eLearning Academy*



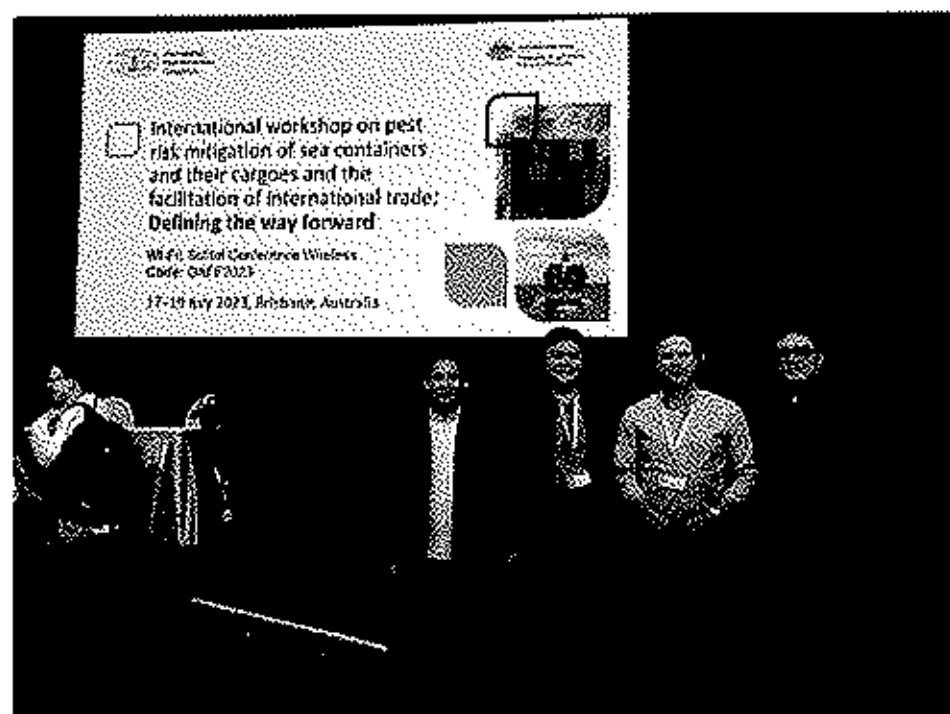
IMPLEMENTATION OF SEA CONTAINER SURVEY SYSTEM IN THE PHILIPPINES



EFFECTIVITY DATE: OCTOBER 19, 2023
CONTROL NO.: 2014QMS-KM5-011
REVISION NO.: 0

CPM WORKSHOPS ON SEA CONTAINER SURVEY

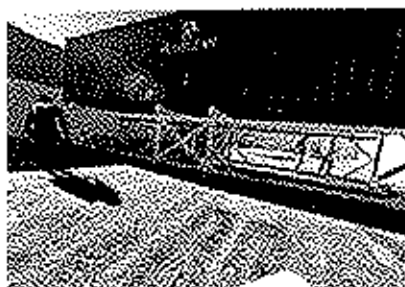
- In 2022, the International Workshop on Reducing the introduction of pest through sea containers pathway was held on September 19-20, 2022, in London, United Kingdom
- In 2023, International Workshop on Pest Risk Mitigation of sea containers and their cargoes and the facilitation of international trade-Defining the way forward was held on July 17-19, 2023, in Brisbane, Australia



International Workshop on Pest Risk Mitigation of sea containers and their cargoes and the facilitation of international trade-Defining the way forward (2023)

Hosted by the IPPC Secretariat-
Department of Agriculture, Fishery
and Forestry (DAFF) of Australia

OBSERVATION ON PRACTICAL APPLICATION OF CONTAINER RISK MANAGEMENT ACTIVITIES



Source: International Workshop on Pest Risk Mitigation on Sea Containers July 17-19, 2023, Brisbane, Australia

WAYS FORWARD

- Understanding the risk – document potential risk
- Raising awareness with stakeholders
- Creation of strategy to mitigate risk
- Challenges associated on the inspection of sea containers

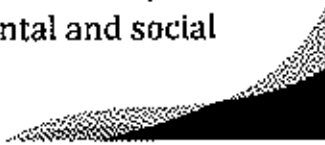
CPM RECOMMENDATION ON SEA CONTAINER PATHWAY

OBJECTIVES:


- Reducing the risk of contamination of sea containers and their cargoes
- Visual examination for contamination of sea containers and their cargoes
- Methods to remove contamination
- Input for effective measures and best practices
- Raising Awareness
- Collaboration with world organization for animal health

Source: IPPC/Draft CPM recommendation on minimizing pest risk associated with sea container

IMPORTANCE OF SEA CONTAINER CLEANLINESS


- **International movement of sea containers, which is defined** as a large metal box used for international shipping of goods, and their **cargoes is a factor that** can potentially facilitate the **introduction and spread of pest** which poses a serious risk to agriculture, forestry and natural resources.
 - A major challenge to prevent the spread of **PEST** is the increasing volume and diversity of **global trade** in food, agricultural and forestry products, as well as the increasing volume and speed of passenger and **freight movements**.
 - Being able to **prevent the spread and establishment of pest is more cost-effective** than the alternatives of maintaining long term control, containment, eradication and managing potentially serious economic, environmental and social consequences.
- 

IMPLEMENTATION OF SEA CONTAINER SURVEY

- In 2016 the IPPC- CPM endorsed a Sea Container Complementary Action Plan (SCCAP) to reduce the pest risk associated with sea containers.
 - An IPPC- Sea Container Task Force was established by CPM to supervise the implementation of the SCCAP.
- 

IMPLEMENTATION OF SEA CONTAINER SURVEY

Memorandum



TO : THE DIRECTOR, BUREAU OF QUARANTINE, DEPARTMENT OF HEALTH

FROM : THE DIRECTOR, BUREAU OF QUARANTINE, DEPARTMENT OF AGRICULTURE

SUBJECT : MEMORANDUM FOR THE DIRECTOR, BUREAU OF QUARANTINE, DEPARTMENT OF HEALTH

RE : THE DIRECTOR, BUREAU OF QUARANTINE, DEPARTMENT OF AGRICULTURE

1. PURPOSE: The purpose of this memorandum is to inform the Director, Bureau of Quarantine, Department of Health, of the activities of the Bureau of Quarantine, Department of Agriculture, in the implementation of the Sea Container Survey.

2. DISCUSSION: The Bureau of Quarantine, Department of Agriculture, is currently conducting a survey of sea containers in the Philippines. The survey is being conducted in order to determine the extent of contamination of sea containers and to develop measures to control the spread of pests and diseases.

3. ACTION: The Bureau of Quarantine, Department of Agriculture, is requesting the Bureau of Quarantine, Department of Health, to assist in the survey by providing information on the activities of the Bureau of Quarantine, Department of Health, in the implementation of the Sea Container Survey.

4. RECOMMENDATION: It is recommended that the Bureau of Quarantine, Department of Health, be requested to assist in the survey by providing information on the activities of the Bureau of Quarantine, Department of Health, in the implementation of the Sea Container Survey.

5. APPROVAL: The Director, Bureau of Quarantine, Department of Agriculture, has approved this memorandum.

6. DATE: 1964

7. SIGNATURE: [Signature]

8. POSITION: Director, Bureau of Quarantine, Department of Agriculture

Survey Form

1. Name of ship or vessel: _____

2. Name of master: _____

3. Name of agent: _____

4. Name of surveyor: _____

5. Date of survey: _____

6. Port of origin: _____

7. Port of destination: _____

8. Type of cargo: _____

9. Number of containers: _____

10. Number of containers inspected: _____

11. Number of containers found contaminated: _____

12. Name of pest or disease: _____

13. Description of contamination: _____

14. Action taken: _____

15. Remarks: _____

IMPLEMENTATION OF SEA CONTAINER SURVEY

- The sea container survey will include the following activities:

1. External inspection- front, back, sides, and if possible, the top and underside the container

2. Internal inspection- flooring, horizontal edges at or near the wall/roof angles, roofs/wall, corners, door and door seals, vents

- Check the seals of the container doors for pests such as ants or spider

3. Container inspection and any contamination information must be recorded using the survey form.

WHAT TO LOOK FOR?

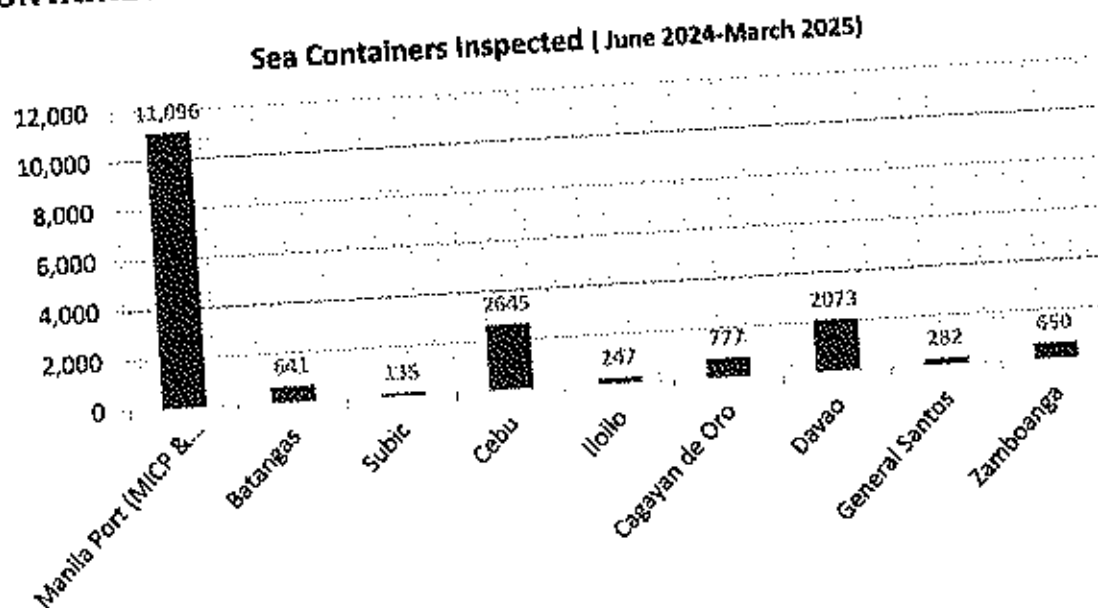
- Plants, Plant products and Plant debris
- Seeds
- Soils
- Beetles, moth, wasps and bees, snails, slugs, ants, and spiders
- Mold and fungi
- Insect and bird droppings or waste
- Egg masses
- Animals, animal parts, blood, excreta, and reproductive components or parts thereof
- Other contaminations that show visible signs of harboring pests

Source: IPPC/FAO UN

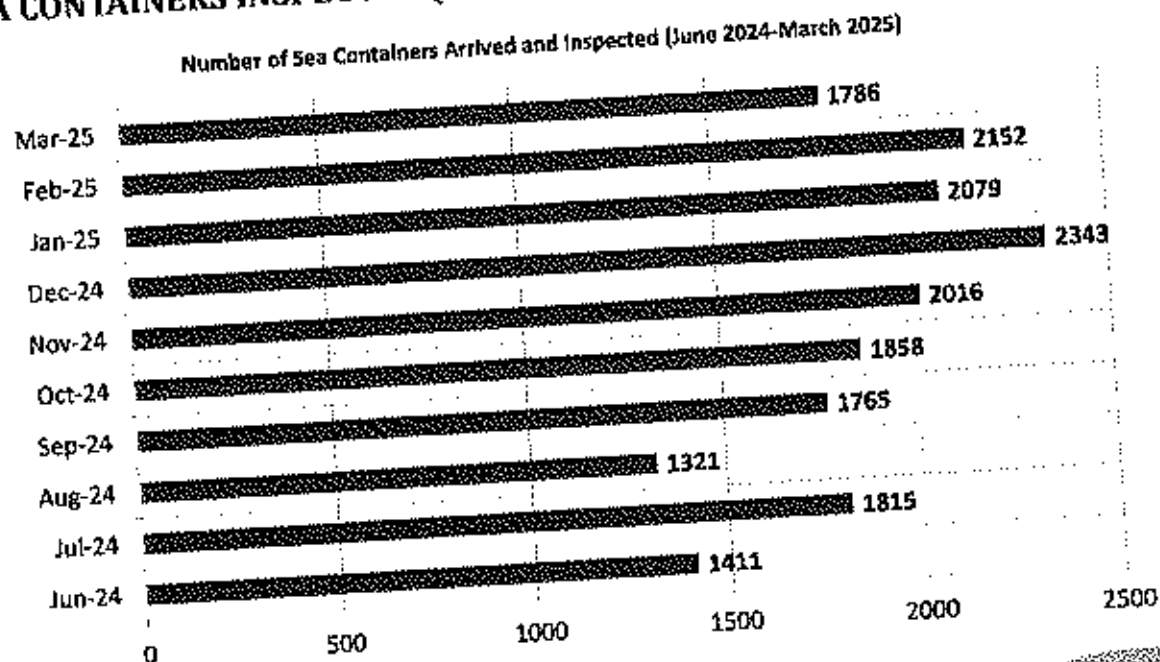
SEA CONTAINERS INSPECTED (IMPORT)

PORT/ESTUARY	MONTHLY INSPECTED										TOTAL NUMBER OF CONTAINERS INSPECTED QUARTERLY
	June 2024	July 2024	August 2024	September 2024	October 2024	November 2024	December 2024	January 2025	February 2025	March 2025	
LITZON											
Manila Port (MCP & South Harbor)	945	1,022	717	1,214	1,205	1,075	1,271	1,258	1,325	1,064	11,096
Iatungas	-	64	25	62	49	150	116	62	71	42	641
Subic	-	-	11	9	29	19	13	16	29	9	135
VISAYAS											
Cebu	225	363	238	151	135	326	250	347	345	264	2,643
Iloilo	23	69	30	18	25	24	11	17	17	13	247
MINDANAO											
Cagayan de Oro	36	68	73	41	85	91	163	80	78	62	777
Davao	137	192	196	177	203	195	421	164	207	181	2,073
General Santos	-	37	31	28	44	30	27	35	19	31	202
Zamboanga	45	0	0	65	83	106	71	100	60	120	650
TOTAL	1,411	1,815	1,321	1,765	1,858	2,016	2,343	2,079	2,152	1,786	18,546

SEA CONTAINERS INSPECTED (IMPORT)



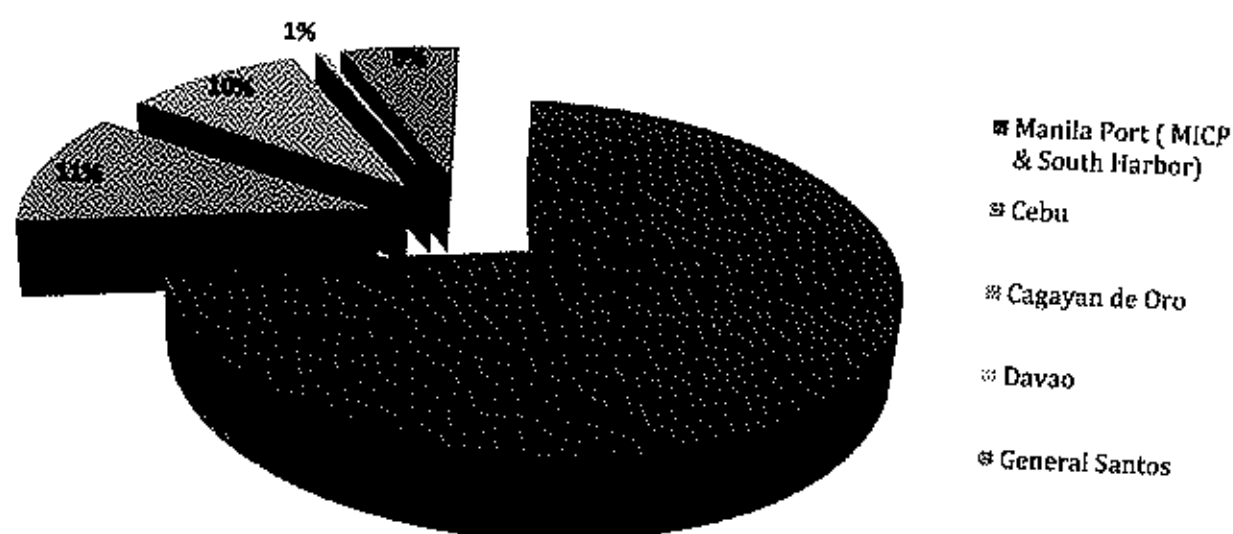
SEA CONTAINERS INSPECTED (IMPORT)



SEA CONTAINERS INSPECTED WITH CONAMINATION (IMPORT)

PORT OF ENTRY	MONTH AND YEAR										TOTAL NUMBER OF CONTAINERS SURVEYED
	June 2024	July 2024	August 2024	September 2024	October 2024	November 2024	December 2024	January 2025	February 2025	March 2025	
LUPZON											
Manila Port (MICP & South Harbor)	0	0	0	0	6	52	141	62	5	0	274
Batangas	0	0	0	0	0	0	0	0	0	0	0
Subic	0	0	0	0	0	0	0	0	0	0	0
VISAYAS											
Cebu	0	4	2	0	0	0	3	0	24	9	42
Iloilo	0	0	0	0	0	0	0	0	0	0	0
MINDANAO											
Cagayan de Oro	0	0	0	9	11	6	2	2	4	9	37
Davao	0	0	0	1	1	0	0	0	0	0	2
General Santos	-	3	3	4	5	4	3	2	0	0	24
Zamboanga	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	7	5	14	17	10	8	4	28	12	379

SEA CONTAINERS INSPECTED WITH CONAMINATION (IMPORT)

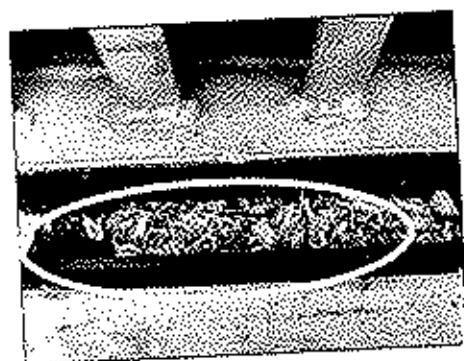


SEA CONTAINERS INSPECTED (IMPORT)

Total number of Sea Container Arrived and Inspected	Total number of Contaminated Sea Container	Percentage of Contaminated Sea Container
18,546	379	2.04 %

"A single pest can destroy the Philippine Agriculture"

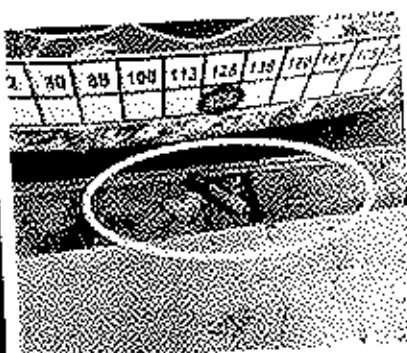
Internal Contamination



Plant debris

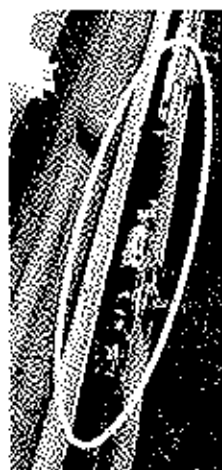


Soil inside the container



Cigarette Butt inside the container

Internal Contamination



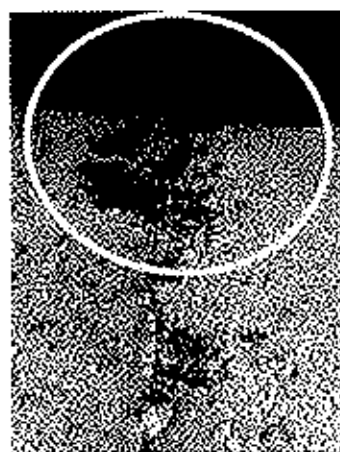
Rust



Cigarette Butt inside the container

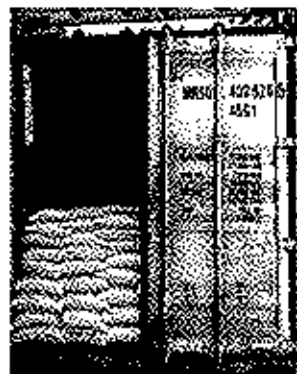


Rusty deformed bars and presence of metals

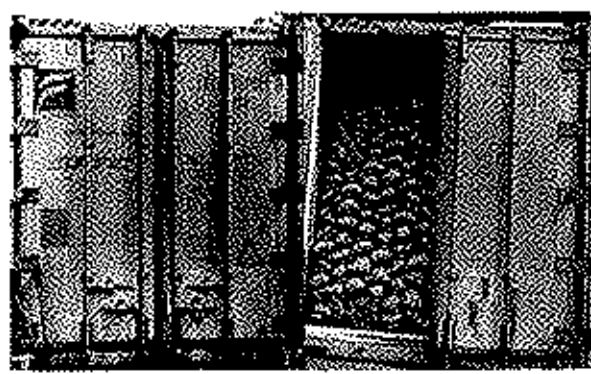


Feed Ingredients contaminated with rust

External Contamination



Rusty Container



Dirty/Dusty Container



Presence of Live Larvae

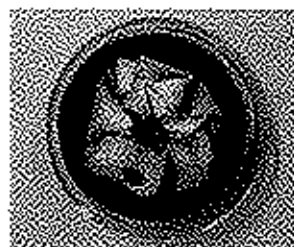
Laboratory analysis of collected samples



Macro testing



Baerman funnel method

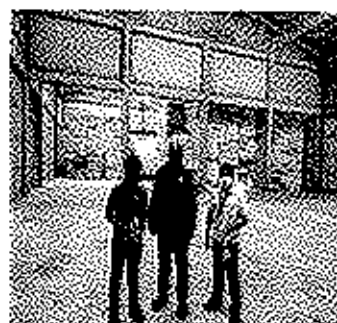


Oostenbrink Dish method



Micro testing

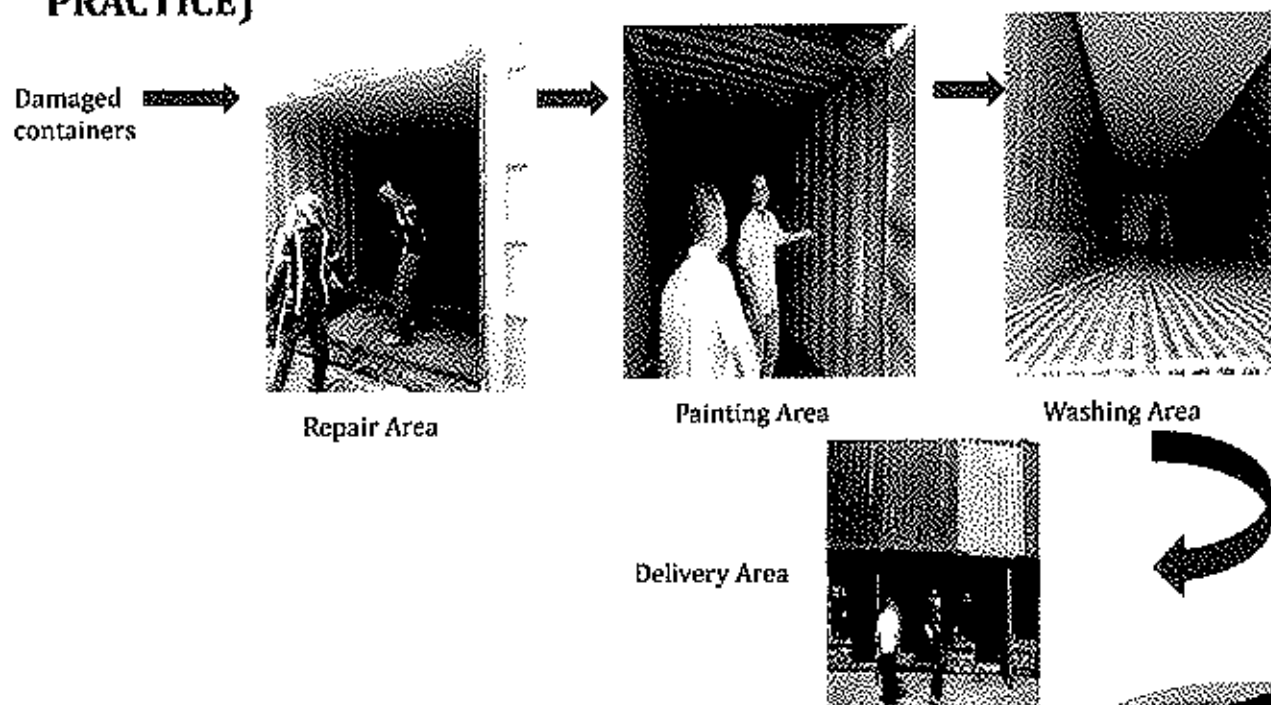
Installation of insect traps in warehouses for storage pest



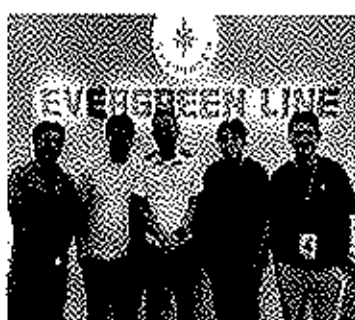
CONTAINER DEPOT (ACTUAL PRACTICE)

Area	In Do's	Findings	Action/Item
Gate In Empty	Conduct inspection	Visual inspection limited to external parts only (Scratches, deformities)	Repair Area/washing Internal parts only
	Classify containers	Food Grade Container	Sweeping, vacuum, washing of internal parts only
		Non-Food Container	Sweeping only


THIRD PARTY PROVIDERS/CONTAINER DEPOT (ACTUAL PRACTICE)



INFORMATION DISSEMINATION AND COORDINATION



EXPORT PROTOCOLS FOR CONTAINER CLEANLINESS

 PORT OF LOS ANGELES & LONG BEACH Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach	PORT OF LOS ANGELES & LONG BEACH Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach
Document: Export Container Cleaning Protocol Version: 1.0 Date: 1/1/2012	Page: 1 of 1
Approved By: [Signature] Approved By: [Signature] Approved By: [Signature]	Approved By: [Signature]

- Purpose:** To ensure that the cleaning and sanitization procedures done at the Port of Los Angeles and Long Beach, California, are consistent with the International Maritime Organization (IMO) and International Maritime Organization (IMO) standards for container cleanliness.
- Scope:** This protocol applies to all containers that are loaded or unloaded at the Port of Los Angeles and Long Beach, California.
- Responsibility:** The Port of Los Angeles and Long Beach, California, is responsible for ensuring that the appropriate cleaning and sanitization procedures are followed.
- Procedure:**
 - The Container Process (PCLP)

Document: Export Container Cleaning Protocol Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach	Document: Export Container Cleaning Protocol Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach
Document: Export Container Cleaning Protocol Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach	Document: Export Container Cleaning Protocol Port of Los Angeles and Long Beach Port of Los Angeles and Long Beach
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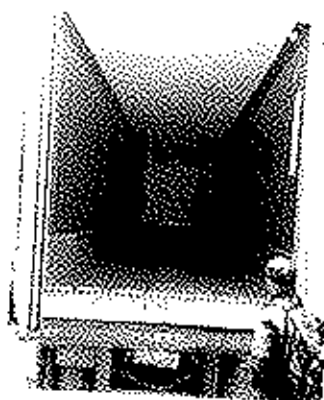
5. Containers (Reefer Vans)

Reefer Vans should be in good condition, clean, no foul odors and any kind of debris and foreign matters upon arrival at the packing house. However, to assure the cleanliness and sanitation, wash and sanitize each van following the standard cleaning procedure before docking into the loading dock.

Before Loading

- a) Apply pressurized water with approved industrial detergent to all surfaces inside the reefer van.
- b) After removing the dirt rinse thoroughly with pressurized water.
- b) Fog the van with Peracetic Acid (Tsunami 15% at 200ppm: 1.32mL, or Vachman 5% at 200ppm -- 4 mL) per Liter H₂O. Note the following consideration in the mixing of PAA:
 - ✓ Solution must be newly prepared; solution that is more than ¼ hour from the time it was prepared should be replaced with a new solution.
 - ✓ Solution should be mixed before it is transferred to the fogging machine tank. Ensure all area is fogged.
 - ✓ Apply the sanitizer for 45 seconds leaving the doors open.
 - ✓ Move the fogging machine to the entrance of the van and apply for another 45 seconds having the doors closed.
 - ✓ Close doors and turn on the refrigeration system of the van for at least 10 minutes to allow equal distribution of the sanitizer.
- c) Reefer van must be pre-cooled for 5 min.
- d) Open the loading door only when reefer van is aligned to the loading dock.
- e) Close the loading door immediately after completing the loading of pallets into the van.
- f) Repeat the procedure for every container to be loaded.

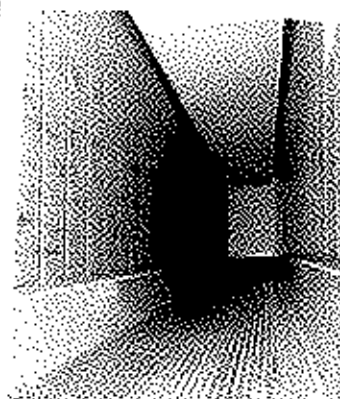
EXPORT PROTOCOLS FOR CONTAINER CLEANLINESS



Washing with
pressurized water in Sea
Container



Fogging of Sea Container



Cleaned Sea Container



Sealing of Sea
Container

CHALLENGES ASSOCIATED WITH SEA CONTAINER SURVEY

- **Congested designated inspection area at ports**
 - Limited space for thorough inspection
 - Limited mobility for inspector to access all sides of a container
 - delay inspections & release may impact to overall port productivity
- **Safety Regulations at Ports**
 - safety concerns regarding working on heights(roofs) and understructure may not possible due to safety requirements or other operational constraints.
- **Equipment's/Tools**
 - lack of elevated stands or raised platforms at the port for underneath inspection
 - lack of telescopic mirrors for inspectors for roofs and upper areas inspection.



RECOMMENDATIONS

- **NPPOs must craft regulation for the implementation of sea container cleanliness**
 - Adoption of international standards for clean containers as technical regulation
 - Approval of technical regulation requiring public consultation and ARTA evaluation & approval
 - Guidelines and licensing of third-party provider ensuring compliance of container cleanliness
 - Inclusion in export certification system for the cleaning of exterior & interior of sea container
- **Partnership & Raising Awareness**
 - with other government agencies and other stakeholders (BOC, other DA agencies, PPA, Port operators, Cargo forwarders, Logistics company, Shipping companies, SUCs, Laboratories and other division in BPI)
- **Technical trainings for Quarantine officers/inspectors and food safety compliance officers for sea container cleanliness standards.**
- **Workplan and budget for local workshops/conferences and trainings for sea container**
- **Continued collection and analysis of data on container cleanliness.**
- **Collect additional input on how to reduce the introduction of pests through the sea container pathway.**
- **Research studies/Pest Risk Analysis (PRAs)**

References

- IPPC Secretariat.2020.Sea Container Survey. Guidelines for National Plant Protection Organizations (NPPOs).Rome, FAO on behalf of the secretariat of the International Plant Protection Convention.<https://doi.org/10.4060/ca7740en>
- International Plant Protection Convention & Food and Agriculture Organization of the United Nation. <https://www.ippc.int/en/core-activities/capacity-development/sea-containers/>
- <https://www.bing.com/search?q=Cambridge%20dictionary.%20Contamination%20English%20meaning%20&q=Cambridge%20dictionary.%20Contamination%20English%20meaning%20&qs=n&form=QBRE&sp=1&lg=0&pg=cambridge%20dictionary.%20contamination%20english%20meaning%20&sc=1252&sk=&cvid=29F3924AD88649CA9A6CF932CB436F25>
- <https://www.qld.gov.au/health/staying-healthy/food-pantry/running-a-food-business/premises-and-equipment/pest-control>
- IPPC Secretariat/DAFF July 2023. International workshop on pest risk mitigation of sea containers and their cargoes and the facilitation of international trade-defining way forward
- Food and Agriculture Organization of the united nations eLearning academy

Department of Agriculture Bureau of Plant Industry

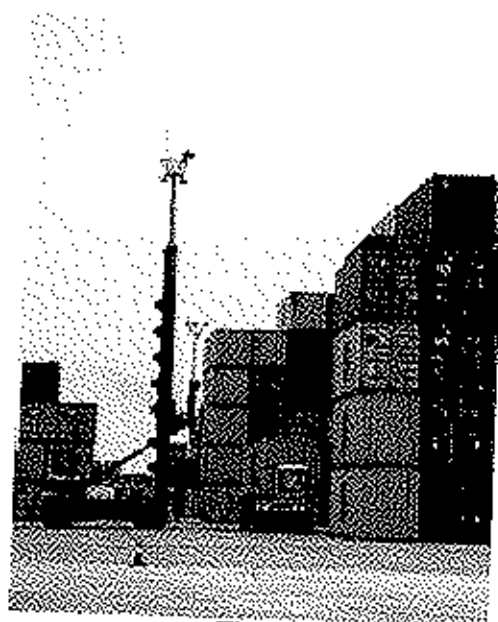
- Office Address: 692 San Andres Street, Malate, Manila, Philippines
- Contact No.:8525-2989/8521-7650/8332-7567/8353-6976
- Email Address:bpi-do@buplant.da.gov.ph/info@buplant.da.gov.ph
- Social Media link :<http://www.facebook.com/BureauOfPlantIndustry>

Thank you!

DEVELOPMENT DATE: OCTOBER 19, 2023
CONTROL NO.: HP-QMS-SMT-F14
REVISION 00.0

MODERNIZING BIOSECURITY REGULATION AND TRADE FACILITATION SUPPORT

Melvin Spreij,
Senior Trade Specialist

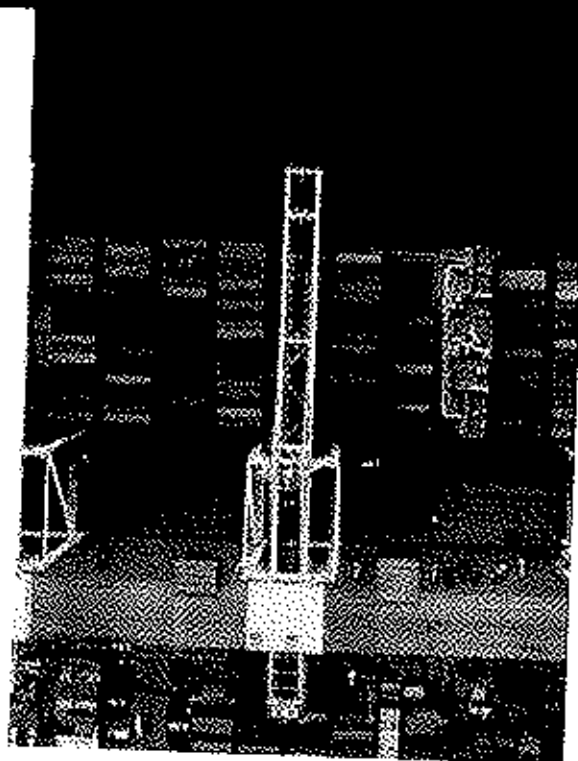


WORLD BANK GROUP

TRADE FACILITATION SUPPORT PROGRAM (TFSP)

Flagship WBG program that aims to enhance trade facilitation in developing countries, including in Asia and the Pacific region. Focused on:

- Identifying bottlenecks in cross-border trade,
- Full and effective implementation of demand-driven practical reforms, and
- Promoting predictability, transparency, and harmonization of systems and procedures



Photos provided by Pexels

THE PROCESS

Identifying Constraints

- TFSP funding helps clients to identify constraints and bottlenecks to cross-border trade and designs practical reforms to address them.
- Supports the ratification of the WTO Trade Facilitation Agreement (TFA) and notification of TACBs
- Conducts gap assessments to implement reform plans

Enhanced systems

- Improved alignment with the TFA through enhanced predictability, transparency, and harmonization of systems and procedures
- Establishment and strengthening of National Trade Facilitation Committees
- Risk-based approaches for border clearance
- Implementation of digital processes (Trade Information Portals and Single Windows) are key components

Partnerships

- Financed by 9 development partners (Australia, Canada, European Commission, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States)
- Leveraging global and regional partnerships is essential for success, ensuring coordination and collaboration on trade facilitation efforts across borders



WORLD BANK GROUP

STRATEGY, FINANCING, AND OUTCOMES

Implementation Approach

- Demand-driven, whole of government approach
- Bridging public and private sectors in TF reforms
- Implemented through the expertise of the World Bank and the International Finance Corporation
- Aims to maximize the impact of trade facilitation initiatives

Financial Contributions

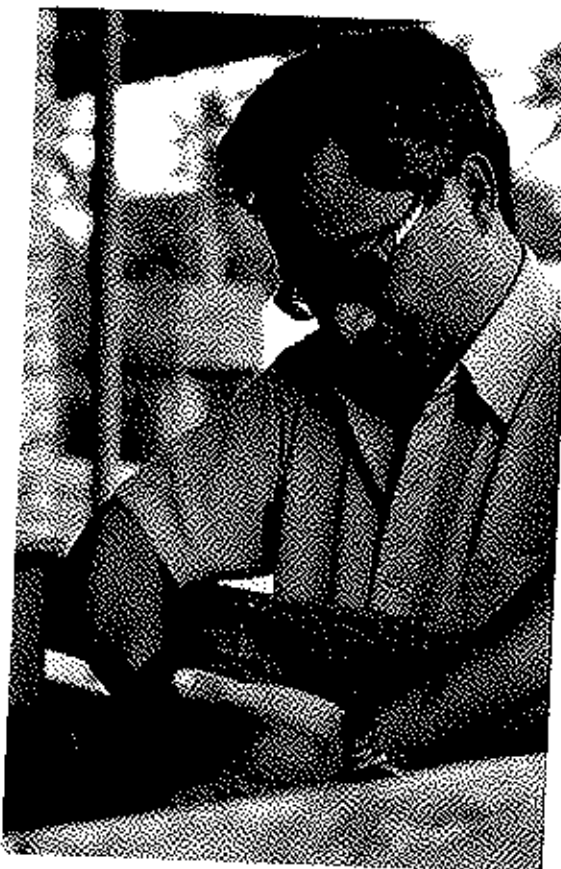
- Substantial contributions for technical assistance
- Linkages between financial operations and technical support allow for maximum impacts

Outcomes

- Significant private sector savings, with specific reforms in various countries leading to substantial economic benefits
- Completed TFSP projects have private sector savings of USD 98.6 million



WORLD BANK GROUP



NEPAL & FIJI

Nepal

- Financing and technical assistance for trade improvements
- Completing the implementation of risk-based border management
- Infrastructure enhancements at borders and laboratories being completed
- TFA gap analysis planned

Fiji

- Initiatives on streamlining border operations, implementing test procedures, enhancing transparency and efficiency



WORLD BANK GROUP

REGIONAL SUPPORT FOR BIOSECURITY LEGISLATIVE REVIEWS

Fiji

- Partner: WB supporting Biosecurity Authority of Fiji (BAF)
- Goal: Update Biosecurity Act 2008 to meet global standards
- Progress: draft bills and regulations under review
- Engagement: public consultations, internal review with BAF and stakeholders
- Next Steps: final vetting by Office of the Solicitor General



WORLD BANK GROUP

REGIONAL SUPPORT FOR BIOSECURITY LEGISLATIVE REVIEWS

Papua New Guinea

- Partners: WB, NAQIA
- Objective: revise outdated biosecurity legislation; align with international standards
- Key areas: plant protection, animal health, pest/disease control, trade facilitation
- Progress: draft Biosecurity Bill 2021 and policy document prepared; consultations ongoing
- Support: policy guidance, stakeholder coordination

Timor Leste

- Drafting and revising legislation, update requirements and prepare implementing regulations
- Objectives: modernization and harmonization to bring biosecurity legislation in line with international obligations and repeal and replace existing legislation
- Current status: new Bill has been drafted and includes detailed instructions; draft is undergoing review and approval process.



WORLD BANK GROUP

SRI LANKA & BANGLADESH

Sri Lanka

- Support to Ministry of Agriculture, Lands and Irrigation and Ministry of Plantation Industries to enhance quality infrastructure

- Increase efficiency and effectiveness of laboratory services
- Development of digitization to support agency operations
- Digital tools for supply chain traceability

Bangladesh

- Initiating TFA gap analysis
- Scoping to determine areas of support

Other Support

- Regional workshop on improving cross-border management (18-19 June, Colombo, Sri Lanka)



TRENDS IN BIOSECURITY REGULATION

- Impact of TFA (re-balancing of legislation, business-friendly, reducing cost)
- Collaboration with private sector (inspection, lab services)
- Technology (digital trade, ePhyto, importance of data collection)
- Increase in S-S and regional trade (capacity to negotiate MRAs, conformity assessment)
- Use of Good Regulatory Practice and periodic review of regulations, including to support TFA implementation



WORLD BANK GROUP

MOVING AHEAD

- Rise in sustainability standards/due diligence regulation
- Comprehensive approach in limiting costs related to NTMs
- Support regulatory reform through WBG investment and programs



In partnership with:





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STRENGTHENING REGIONAL BIOSECURITY

Insights from OIRSA's Visit to DAFF Australia



ORGANISMO INTERNACIONAL
REGIONAL DE SANIDAD
AGROPECUARIA

MÉXICO - EL SALVADOR - GUATEMALA - HONDURAS - NICARAGUA - COSTA RICA - PANAMÁ



Australian Government
Department of Agriculture,
Fisheries and Forestry

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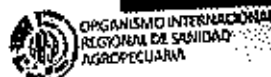


MÉXICO - EL SALVADOR - GUATEMALA - HONDURAS - NICARAGUA - COSTA RICA - PANAMÁ



BACKGROUND

OIRSA and Australia's DAFF share a history of cooperation and friendship, founded on the mutual realization that, despite operating in different contexts, both institutions face similar challenges in managing biosecurity to protect their agricultural and livestock resources. This shared understanding opened the door for collaborative support and laid the groundwork for strengthening institutional ties. It was from this realization that the idea emerged to carry out a technical visit to the central, regional offices, and operational sites of the Department of Agriculture, Fisheries and Forestry of Australia (DAFF). Following a full year of careful planning, this initiative was successfully implemented in early 2025.



ORGANISMO INTERNACIONAL
REGIONAL DE SANIDAD
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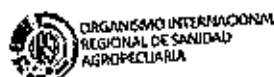
MEMORIA DE LA VISITA TECNICA A AUSTRALIA DEL 12 AL 25 DE FEBRERO DE 2025



Introduction

As part of its commitment to improving quarantine services, OIRSA has strengthened its cooperation with the Department of Agriculture, Fisheries and Forestry of Australia (DAFF), recognized for its biosecurity management model. Within this framework, a technical visit was carried out from February 12 to 25, 2025, to DAFF's offices and operational sites.

The purpose was to exchange experiences and learn about sanitary intelligence tools applied to decision-making. This mission helped identify innovative technologies and key areas of collaboration, contributing to the strengthening of biosecurity in the OIRSA region.



ORGANISMO INTERNACIONAL
REGIONAL DE SANIDAD
AGROPECUARIA

MEMORIA DE LA VISITA TECNICA A AUSTRALIA DEL 12 AL 25 DE FEBRERO DE 2025

VISIT TO DAFF HEADQUARTERS -

CANBERRA, AUSTRALIA

Orientation

Gain firsthand knowledge of DAFF's central offices and their operational structure.

Immersion

Participate in presentations and discussions on a variety of relevant biosecurity topics.

Networking

Meet with the heads of DAFF's various departments to understand their roles and responsibilities.

We began our visit with a tour of DAFF's central offices, where we met with department heads who presented key topics of interest to the delegates.

VISIT TO DAFF REGIONAL OFFICES AND OPERATIONAL FACILITIES

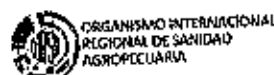
GUIDED TOUR OF OPERATIONS AND FACILITIES

- BRISBANE MAIL FACILITY
- BRISBANE INTERNATIONAL AIRPORT
- BRISBANE PORT FACILITY
- DETECTOR DOG TRAINING CENTRE
- POST-ENTRY QUARANTINE FACILITY
- STERITECH (GAMMA IRRADIATION FACILITY)
- MELBOURNE INTERNATIONAL ROBO AUTOMOTIVE TERMINAL (MIRRA)
- MAINFREIGHT - INSPECTION OF CUT FLOWERS

BIOSECURITY TRAINING CENTRE- BRISBANE, AUSTRALIA

We were accompanied by Prof. David Mackay, from the Biosecurity Training Centre (BTC), who delivered professional training and specialized programs for the biosecurity workforce. BTC is committed to building a prepared, skilled, capable, and agile workforce that strengthens Australia's biosecurity system.

Special thanks to Professor David Mackay for his valuable insights and support throughout our visit.



MEMORANDUM DE ENTENDIMIENTO ENTRE EL GOBIERNO DE LA REPUBLICA DE COLOMBIA Y EL GOBIERNO DE AUSTRALIA

VISIT TO CEBRA Centre of Excellence for Biosecurity Risk Analysis

MELBOURNE, AUSTRALIA

CEBRA is the leading biosecurity risk analysis research center for Australia and New Zealand, bringing together highly skilled teams conducting cutting-edge research to address global biosecurity challenges.

The center provides expert analysis and advice on risk management to minimize the entry, establishment, and spread of exotic pests and diseases.

CEBRA plays a key role in developing tools that support regulators in:

- Anticipating and preventing threats before they cross borders
- Conducting effective border controls
- Detecting incursions and guiding post-border response strategies

Special thanks to Professor Anthony Robinson for his valuable insights and support throughout our visit.



MEMORANDUM DE ENTENDIMIENTO ENTRE EL GOBIERNO DE LA REPUBLICA DE COLOMBIA Y EL GOBIERNO DE AUSTRALIA

CLOSING REMARKS



Networking

Reinforced ties of friendship and collaboration between OIRSA and DAPF.



Technologies

Explored cutting-edge technologies to enhance and boost biosecurity operations.



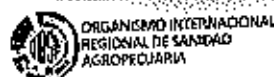
Risk Analysis

Gained insights into risk analysis systems supporting early detection and strategic decisions.



Collaboration

Valuable examples of collaborative efforts that contribute to more effective biosecurity risk management.

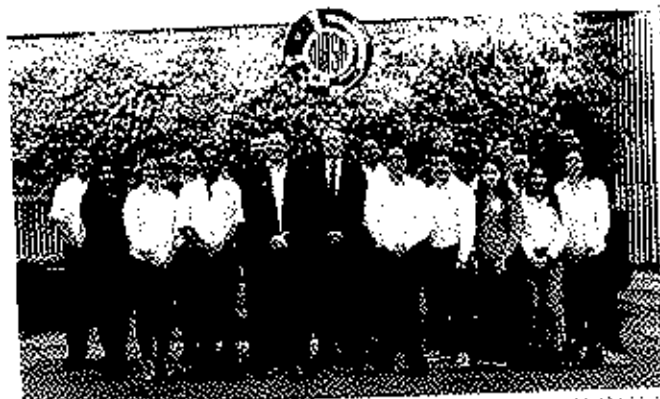


MEMORIA DE LA VISITA DE LA DELEGACION ARGENTINA AL CENTRO AUSTRAL DE PROTECCION DE LA SANIDAD AGROPECUARIA (DAPF) EN AUSTRALIA

On behalf of our delegation, I would like to express our deepest gratitude for the warm welcome and the invaluable experience provided during our recent visit to your offices and operational sites in Australia.

We sincerely appreciate the openness with which we were received and your willingness to share detailed insights into your biosecurity operations.

The opportunity to observe your protocols and strategies firsthand has been highly enriching and represents a significant contribution to strengthening agricultural protection systems across the OIRSA region.



Special thanks to:
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 Jack Berkefeld
 Katelyn Croker
 Lydia Haile

