附件4

SOLVAY

Progress beyond

Government Affairs

# Cylinderized Phosphine Fumigation: supporting a valid alternative to Methyl Bromide

Presentation to Quarantine Regulators
May 2021

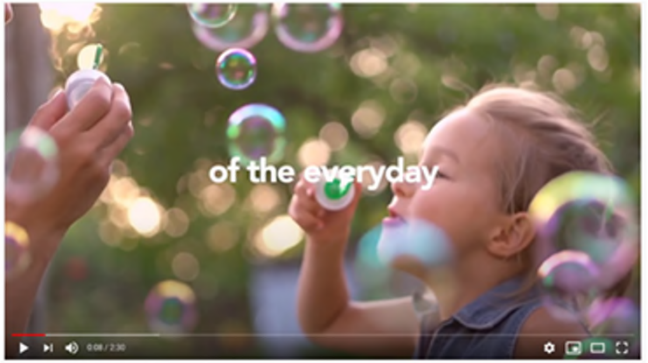

78

# Solvay Today

We are a science company whose technologies bring benefits to many aspects of daily life.

Our innovative solutions contribute to safer, cleaner, and more sustainable products found in homes, food and consumer goods, planes, cars, batteries, smart devices, health care applications, water and air purification systems.

Our Group seeks to create sustainable shared value for all, notably through its Solvay One Planet plan crafted around three pillars: protecting the climate, preserving resources and fostering better life.




**€8.9bn**
Underlying net sales

**€1.9bn**
Underlying EBITDA

**52%**
Net sales sustainable solutions

**23,000**
Employees

**64**
Countries

**110**
Sites across the globe

79

*2020 figures

# 2030 Solvay One Planet Goals & Achievements 2020

**10 ambitious external objectives to reduce our global impact (basis: 2018)**

## CLIMATE

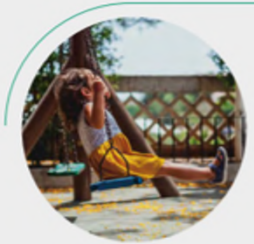
### FIGHT AGAINST CLIMATE CRISIS

| Align greenhouse gas emissions with Paris Agreement and SBTi | Phase out coal | Reduce negative pressure on biodiversity |
|---|---|---|
| Reduce by 26% (-2%/y) | Achieve 100% | 30% reduction |

## RESOURCES

### EMBED CIRCULAR BUSINESS

| Increase Sustainable Solutions revenues | Increase circularity | Reduce non-recoverable industrial waste | Reduce intake of freshwater |
|---|---|---|---|
| Achieve 65% vs 50% | More than double | 30% reduction | 25% reduction |



## BETTER LIFE

### IMPROVE QUALITY OF LIFE

| Safety is a priority | Accelerate Inclusion & Diversity | Extend maternity leave time and open it to co-parents |
|---|---|---|
| Aim for zero accident | Parity in 2035 vs 24% for mid & senior management | 16 weeks regardless of the gender in 2021 |

## ➔ Achievements within 2020 :

1 MT CO2 Reduction
28 projects (19 in operation)

#10 in Solar Power installed in USA

Recognition on biodiversity
*Oct 1st, 2020*
act4nature international

52% Sustainable solutions

CIRCULAR ECONOMY
+500 People trained
6 Joint program with ELLEN MACARTHUR FOUNDATION
6 Projects with customers

- 27% non-recoverable industrial waste since 2018

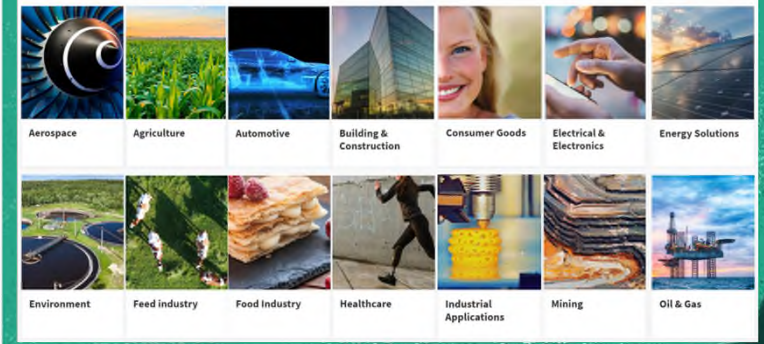
- 5% intake of fresh water since 2018

Extension of maternity leave time to 16 weeks and to all co-parents

Solvay Solidarity Fund

Financial support provided to **1,600 families**
**€15** million gathered (to support employees and communities facing Covid-19)

## Our markets




# Our solutions for a better world

**Agriculture**

**6% of our revenue**

# POST HARVEST CROP PROTECTION AGAINST PESTS :

## PREVENTING GLOBAL BIOSECURITY RISKS AND HUGE FOOD LOSSES

➔ **POST HARVEST FUMIGATION IS LIMITED TO CONFINED SPACES, INVOLVES SMALL CHEMICALS VOLUME USAGE:**
**silos, warehouses, containers, bulk shiploads in intercontinental trade. NO RELEASE IN OPEN SPACES**

➔ **PREVENTING FOOD LOSSES REDUCES GLOBAL PRESSURE ON FOOD PRODUCTION**
**According to various surveys, stored food losses due to pests range from 5% to up to 1/3 of total stored consignments**

➔ **THEREBY REDUCING FERTILIZER AND OTHER CHEMICALS CONSUMPTION !**
**Contribution to the CIRCULAR ECONOMY and CLIMATE CHANGE MITIGATION: urea based fertilizers emit GHG…**

## ONE APPLICATION : QUARANTINE & PRE SHIPMENT FUMIGATION

**A critical activity monitored by the Montreal Protocol**

➔ **Methyl Bromide still accepted**
**despite Ozone Depletion impact**

➔ **Solvay Alternative:**
**Cylinderized Phosphine gas $PH_3$**

# METAL PHOSPHIDE AND CYLINDERIZED PHOSPHINE

## 2 DIFFERENT PHOSPHINE DELIVERING PRODUCTS

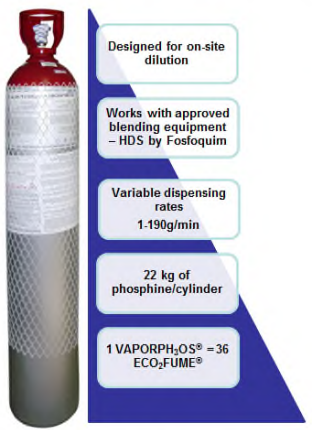
### Aluminum/Magnesium Phosphide Tablets


- Cheap and perceived easy use by anyone
  Available on internet but…

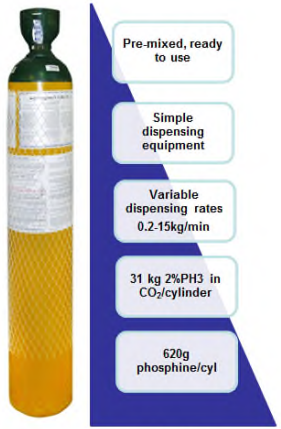
- Efficiency issues, especially in cold weather
- Leaves residues which damage fruits
- Costly removal of harmful metal dust residue
- Flammable in hot and humid conditions

**DO NOT CONFUSE !!**

### SOLVAY Phosphine Fumigant Gas



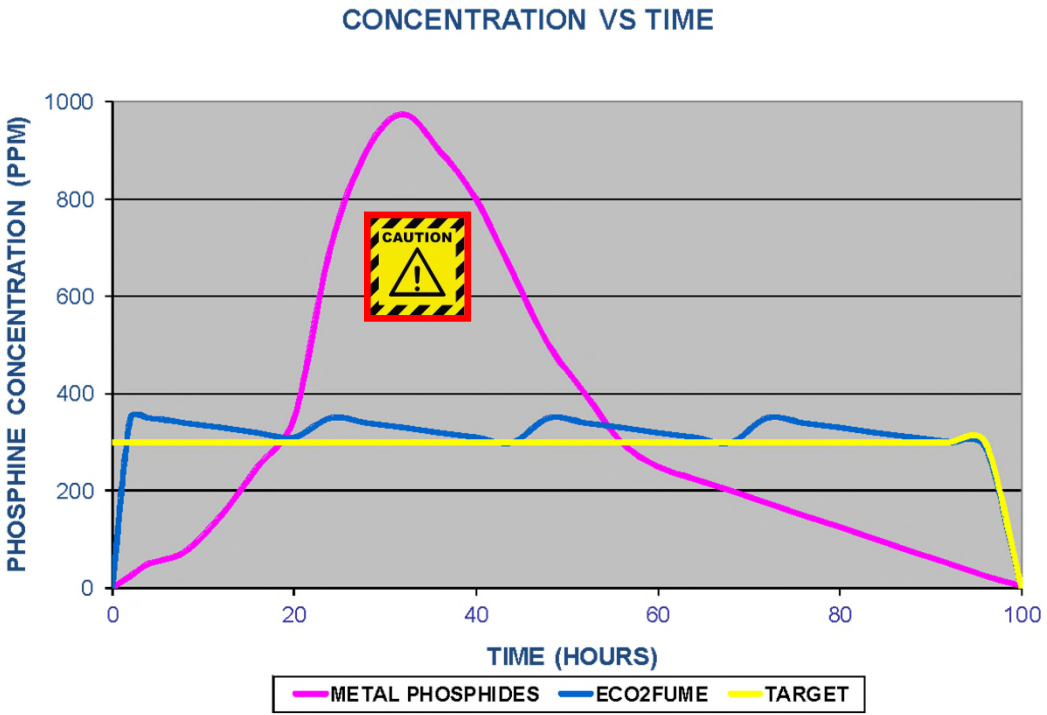

**VAPORPH$_3$OS®**
100% $PH_3$ for on-site dilution




**ECO$_2$FUME®**
2% $PH_3$ (wt.) in 98% $CO_2$

- Pure Phosphine $PH_3$ gas in reusable tanks
- Controlled sourcing: no parallel supplies
- Controlled fumigation atmosphere with Product Stewardship training
- No residue, no traces, no risks when used with dedicated equipment

# EFFICIENCY COMPARISON WITH METAL PHOSPHIDE



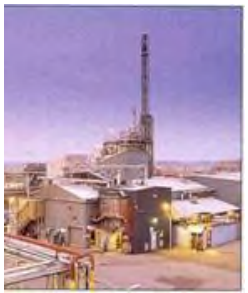

## Narcosis :


Under too high fumigant gas concentration, some insects just stop breathing and can do so for days without dying. When fumigation ends, they simply come out of lethargy and proliferate. This is known as **Phosphine resistance**

With $PH_3$ **controlled dosage**, immediately reaching lethal dosage **avoids gas peaks, when pests survival cases are observed**

# RESPONSIBLE CARE® AND PRODUCT STEWARDSHIP

Inception



Production

Transportation

Use

Refilled

- **Solvay implements Responsible Care initiatives and practices for all its businesses: responsible and ethical management of the health, safety and environmental aspects of our products from its inception through production to its ultimate use and disposal**
- **Product Stewardship trainings are conducted with Cylinderized Phosphine customers as standard practice, to ensure safe and effective use of our products. Essential requirement prior to shipping product.**

# PHOSPHINE FUMIGATION APPROVED USES FOR QPS

- **$ECO_2FUME^{®}$ and $VAPORPH_3OS^{®}$ are recognized as efficient, safe(*) and residue free fumigant for control of phosphine resistant insects on grains and oilseeds, insect pests in produce, buildings, chicken sheds (new application), cut flowers, logs…**

- **Approved in a growing list of countries for Quarantine and Pre-Shipment (QPS) application, to treat various commodities, food and non-food:**

  - South Korea: $ECO_2FUME^{®}$ approved replacement to methyl bromide for QPS treatment of cut flowers, nursery trees, pineapple, banana, pine wood, root, leafy and stem vegetables, rice grain and seeds
  - Indonesia: $ECO_2FUME^{®}$ approved as a primary fumigant for QPS treatment of rice, coffee, cacao, pineapple, mangosteen and tobacco.
  - PNG, Fiji: $ECO_2FUME^{®}$ approved as replacement to methyl bromide for QPS treatment of imported bulk rice, wheat and stock feeds and other bulk commodities as well as exported coffee beans.
  - Uruguay: $VAPORPH_3OS^{®}$ approved for QPS and in-transit fumigation of exported logs to China.
  - New Zealand: $VAPORPH_3OS^{®}$ for logs export under review by Ministry of Primary Industries
  - US citrus exports to Australia and S Korea: $VAPORPH_3OS^{®}$ approved in systems approach
  - Turkey: $ECO_2FUME^{®}$ approved as methyl bromide replacement for QPS of exported dried fruits.
  - Chile: $VAPORPH_3OS^{®}$ approved for QPS treatment of selected exported fruits and vegetables to the US, Japan, Mexico and other destinations
  - UAE, Oman and Egypt: $ECO_2FUME^{®}$ approved for QPS treatment of exported dates.
  - Sri Lanka: $ECO_2FUME^{®}$ approved for QPS treatment of exported mangoes, cucurbits, Ceylon tea, bitter gourd and imported rubber caps.
  - **Vietnam: $ECO_2FUME^{®}$ and $VAPORPH_3OS^{®}$ approved for DDGS grains exported from US**
  - Australia: $ECO_2FUME^{®}$ and $VAPORPH_3OS^{®}$ under approval process for Dark Beetle elimination for chicken sheds
    Newly established protocol for treatment of Khapra beetle under review of plant import quarantine team Australian DAWR
  - Thailand $ECO_2FUME^{®}$ under paid commercial trials for addressing Salmonella infestation on breeder house in a major chicken company
  - **Work in Progress in the EU towards registration in Belgium and Greece. This would allow massive use from Antwerp port**

(*) when used in accordance to the legal label in a given country

# PHOSPHINE FUMIGATION PROTOCOLS FOR QPS

| Commodity | Plant Pest Type | Phosphine Conc. (Min.) | Exposure Time | Temperature | Reference |
|---|---|---|---|---|---|
| Pineapple | Purple scale, Citrus mealy bug | 1400 ppm | 24 hours | 5°C or higher | NPQS Korea 2015 |
| Citrus | Queensland fruit fly (Bactrocera tyroni) | 1400 ppm | 48 hours | 23 – 25°C | Williams 2000 |
| Citrus | Citrus red scale | 1500 ppm | 48 hours | 5°C | USDA ARS 2014 |
| Mango | Fruit fly | 1400 ppm | 24 hours | 26 - 33°C | NPQS Sri Lanka 2017 |
| Bitter Gourd | Melon fly | 1400 ppm | 24 hours | 26 - 33°C | NPQS Sri Lanka 2017 |
| Cut Flowers (chrysanthemum, rose, lily) | Western flower thrips, two spotted spider mites, cotton aphids | 1400 ppm | 24 hours | 8°C or higher | NPQS Korea 2015 |
| Dracaena house plants | Purple scale, aphids, white fly, scales | 1400 ppm | 24 hours | 15°C or higher | NPQS Korea 2015 |
| Mushrooms | Lycoriella mali (sciacarid fly) | 1400 ppm | 24 hours | 5°C or higher | NPQS Korea 2015 |
| Timber pine<br>Pine Nut pine | Pine weevil, white ant, Bursaphelenchus xylophilus, Monochamus alternatus, Monochamus saltuarius (nematodes) | 2800 ppm | 5 days | 5°C or higher | NPQS Korea 2015 |
| Pineapple | Planococcus minor (mealy bug) | 200 ppm | 7 hours | 26 – 30°C | BIOTROP 2012 |
| Mangosteen | Planococcus minor | 200 ppm | 7 hours | 26 – 30°C | BIOTROP 2012 |
| Orchids | Planococcus minor | 200 ppm | 7 hours | 26 – 30°C | BIOTROP 2012 |
| Dried Fruits | Ephestia Cautella Plodia Interpunctella | 1000 ppm | 24 hours | 20 - 27°C | Ankara Univ. 2013 |
| Dates | Ephestia Cautella Red flour beetle<br>Saw toothed grain beetle | 700 ppm<br>1000 ppm<br>1500 ppm | 72 hours<br>48 hours<br>24 hours | 30°C or higher | ARC Egypt 2013 |
| Dried Distillers Grain with Solubles (DDGS) | Red flour beetle | 750 ppm<br>750 ppm<br>750 ppm | 3. days<br>4. days<br>5. days | >20°C<br>15 - 20°C<br>10 - 15°C | USDA ARS 2014 |
| Export Logs | Longhorn beetle | 3500 ppm | 5 days | >20°C | Zhang et al 2007 |
| Imported Rubber Caps | Black soldier fly | 1000 ppm | 24 hours | 10°C or higher | NPQS Sri Lanka 2020 |
| Export grains | Khapra beetle (*Trogoderma granarium*) | 1000 ppm | 3 days | 25°C or higher | Univ. of Thessaly Greece 2020 |

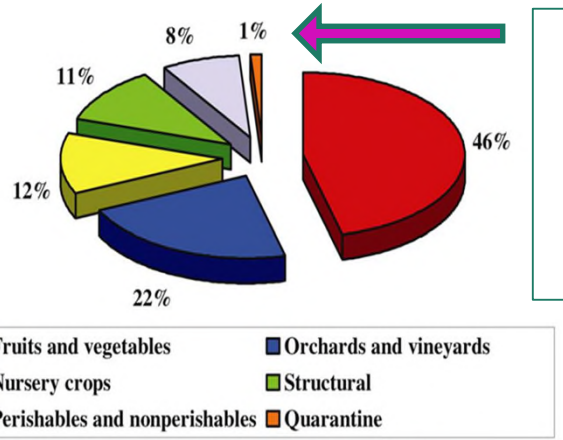
# METHYL BROMIDE ODS FUMIGANT STILL IN USE

- **Methyl Bromide is an efficient fumigant but as an Ozone Depletion Potential material it was to be phased out following the Montreal Protocol.**
- **Methyl Bromide is a toxic material which poses other risks and harmful effects, in particular occupational neurologic effects upon prolonged exposure for fumigation employees** https://www.epa.gov/sites/production/files/2016-09/documents/methyl-bromide.pdf
- **Montreal Protocol Methyl Bromide phase out was effective but remains approved for QUARANTINE & PRE SHIPMENT (QPS) application since 1992 (Article 2H exception), following the absence of valid alternatives as considered at that time**

**IN, CN, VN are large Methyl Bromide consumers !**

| MT/year | 95~2000 yearly avg | 2015~19 yearly avg | % |
|---|---|---|---|
| AU | 348 | 789 | 127% |
| NZ | 64 | 607 | 850% |
| CN | 477 | 1,107 | 132% |
| IN | 229 | 1,245 | 443% |
| JP | 1,920 | 456 | -76% |
| KR | 838 | 455 | -46% |
| ID | 174 | 135 | -23% |
| SG | 66 | 53 | -20% |
| MY | 63 | 146 | 130% |
| TH | 254 | 177 | -30% |
| VN | 320 | 910 | 184% |
| **Total Asia** | **6,604** | **6,485** | **-2%** |

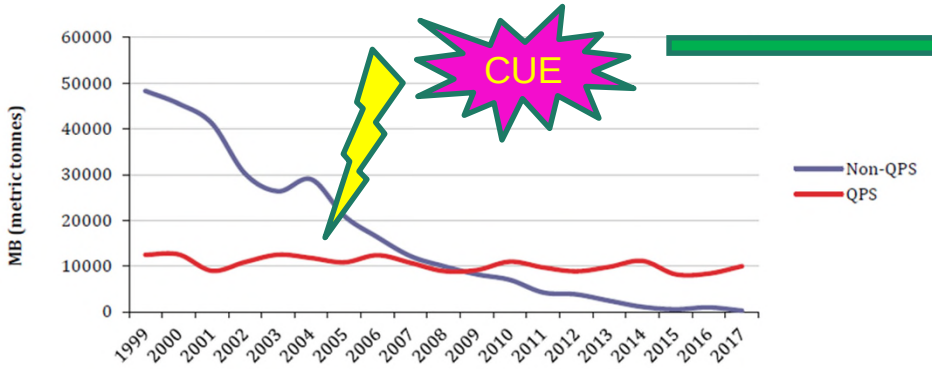
DATA: UNEP



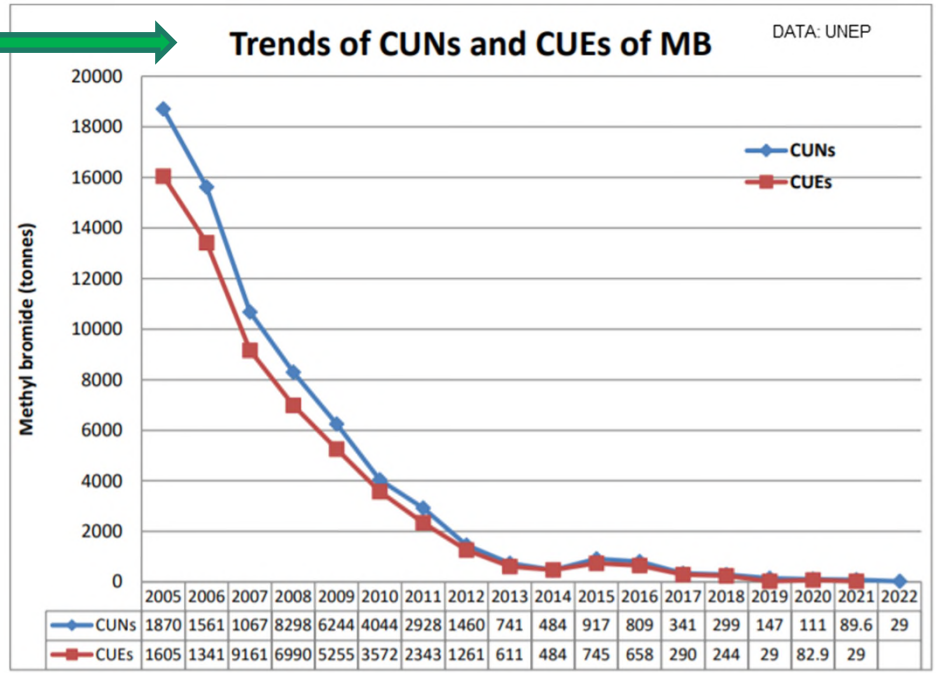

Distribution of global methyl bromide use among different applications during 1992 (51,68).

**Fact** : Methyl Bromide for QPS application was insignificant when the Montreal Protocol was implemented, but grew unnoticed since then, **thereby extending environmental impact**

# NO PRESSURE TO REPLACE METHYL BROMIDE FOR QPS




Source: Ozone Secretariat data centre, 2018




- **Despite recommendation to find alternatives, Methyl Bromide consumption for QPS has not decreased under Montreal Protocol. The Article 2H exception acts as a disincentive to conversion to alternatives**

- **In 2005, the Critical Use Exception mechanism was set up to accelerate full phase-out of non-QPS MB use, imposing case by case annual capped MB consumption, after review of potential alternatives.**

**The CUE process encouraged innovation in valid new pest control techniques.**
**Non-QPS MB consumption almost disappeared by now**



Submit QPS MB use to CUE Process

# SUBMITTING QPS METHYL BROMIDE CONSUMPTION TO CUE ANNUAL REVIEW

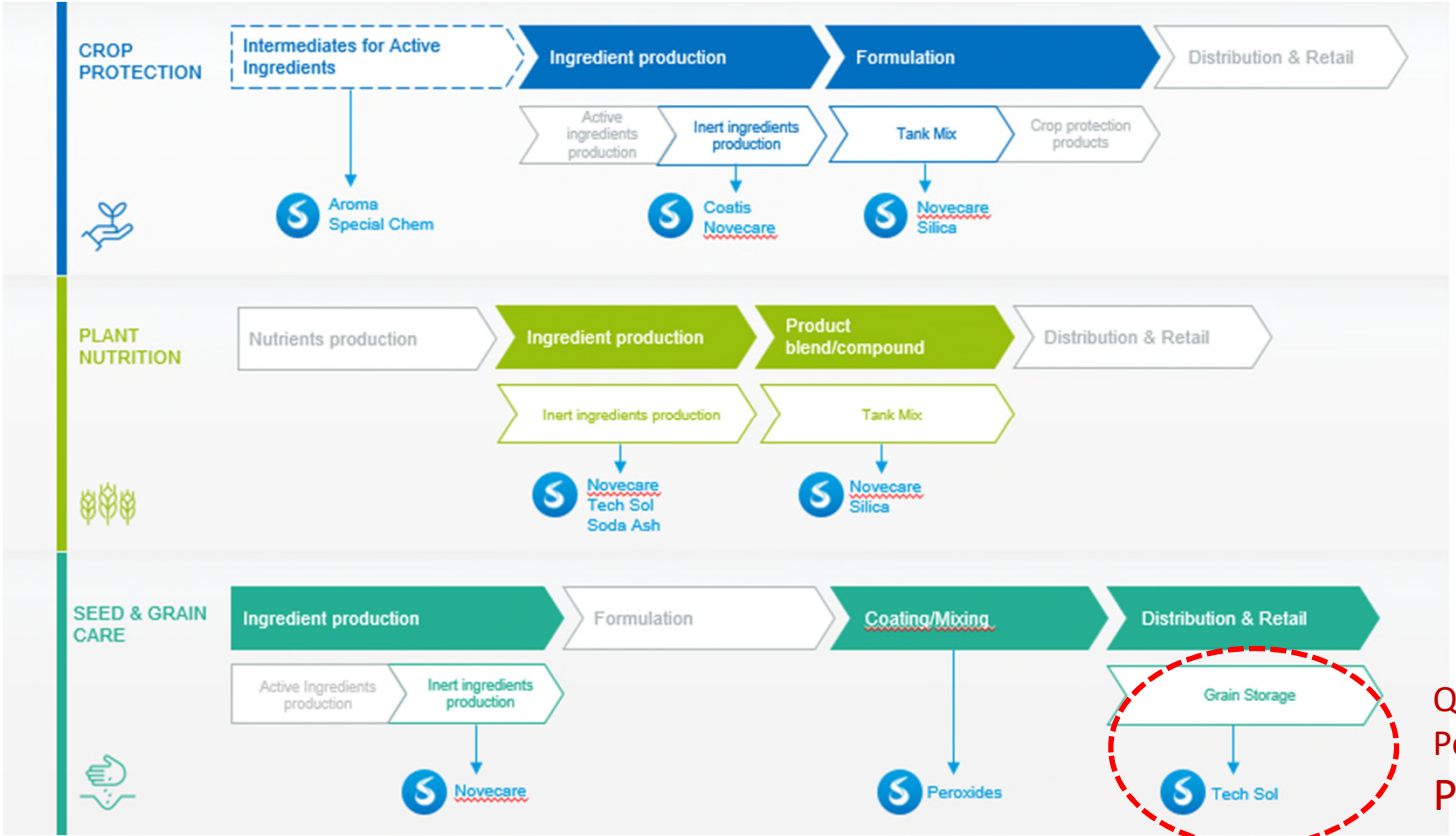
- **Fact: since 1992, scientific progress in various techniques have been recognized as effective pest control methods for QPS, but have reached only limited deployment**
- **Fact: since 2010, the EU has fully banned Methyl Bromide use for QPS application, and have not faced any major pest crisis in this field since then**
- **Fact: meeting with various national biosecurity authorities reveal an interest for change, but the absence of strong incentive towards experimenting with alternatives due to Article 2H exception remains mainstream. Officially reporting QPS Methyl Bromide volume used appears only as a minor administrative burden**
- **Fact: efforts by Methyl Bromide proponents for QPS application to reduce Ozone Depletion emissions since then have been limited. Renewed efforts to be pushed from October 2020 will be costly. Besides, new questionable MB uses of QPS have recently been identified**

(TEAP Progress report, May 2019)

**➔ After nearly 3 decades of status quo and considering the clear success realized for non-QPS uses, subjecting annual CUE review of potential alternative processes to QPS application would be the safest way to achieve real ODS elimination.**

# Thank you.

# AGRICULTURE : Solvay covering many areas




Quarantine & Pre Shipment
Post-harvest Fumigation:
Phosphine Gas $PH_3$



Choice towards Cylinderized Phosphine Fumigation

附件5

ORGANISMO INTERNACIONAL REGIONAL
DE SANIDAD AGROPECUARIA

# Priority process of regulated pests in OIRSA region

*Nancy Villegas, OIRSA*

QRM Quarantine Regulators Meeting

*Advancing biosecurity systems through a success-oriented plan*

ORGANISMO INTERNACIONAL REGIONAL
DE SANIDAD AGROPECUARIA

# History

**1947**
The International Committee Against Locusts (**CICLA**) was created.

**1953**
**OIRSA was created** at the 5th Meeting of Ministers of Agriculture of México, Central America and Panamá, held in El Salvador.

**1961**
The organization sets its **Headquarters in El Salvador**

**1973**
**The International Fumigation Service (SIF)** was created in the 20th Ministers' Meeting.

SITC
Servicio Internacional de Tratamientos Cuarentenarios

**1983**
**Representative offices** are opened in Member States

**2014**
The 2015-2025 **Strategic Plan was established.**

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA

# Mission

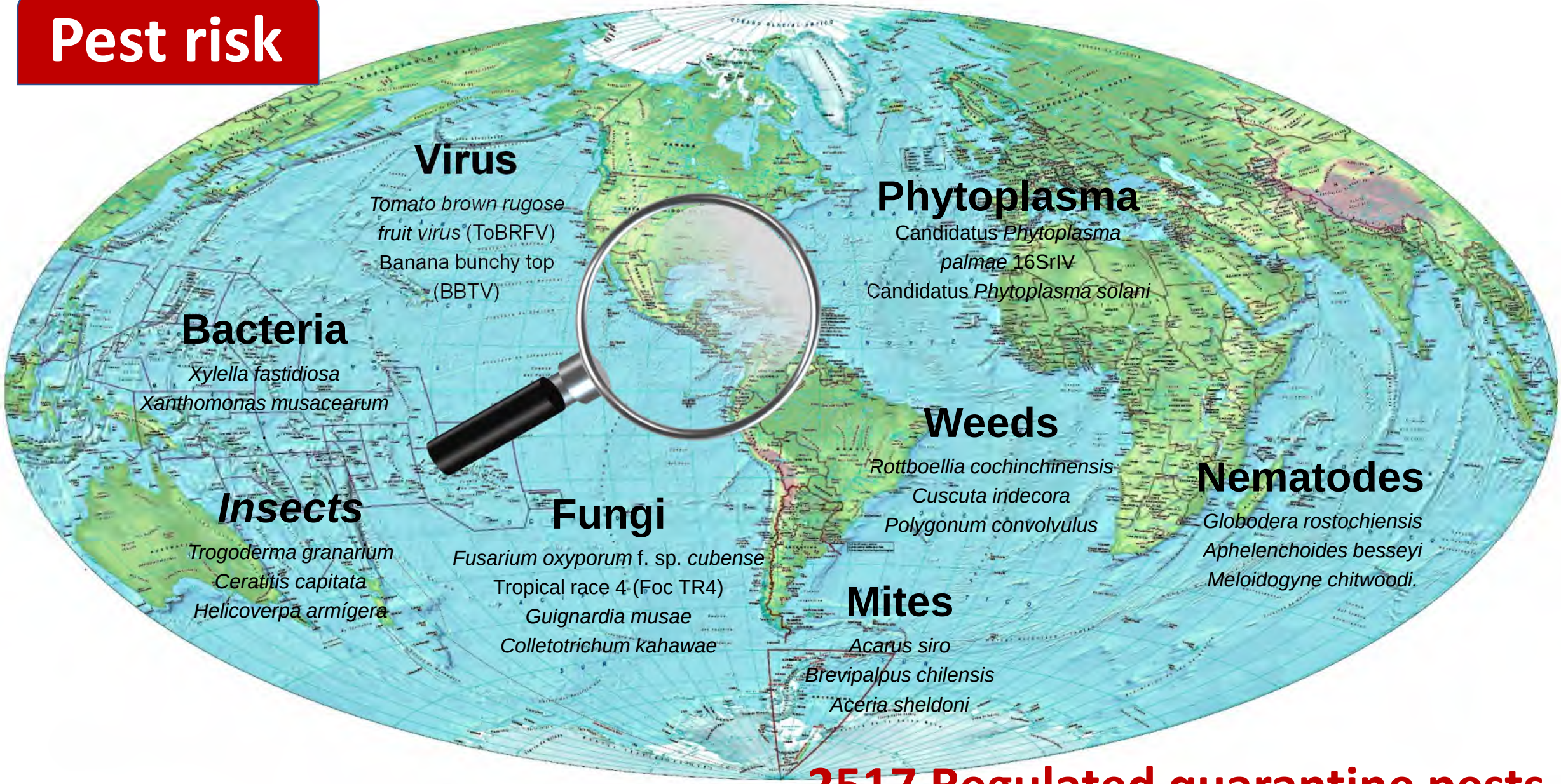
To support the Ministries and Secretariats of Agriculture and Livestock of the Member States, in their efforts for the development of their plans for animal and plant health, quarantine services and food safety, and thus contribute to the social and economic development of the population through a healthy agricultural production, in harmony with the environment, and facilitating international trade.

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA

# OIRSA Functions

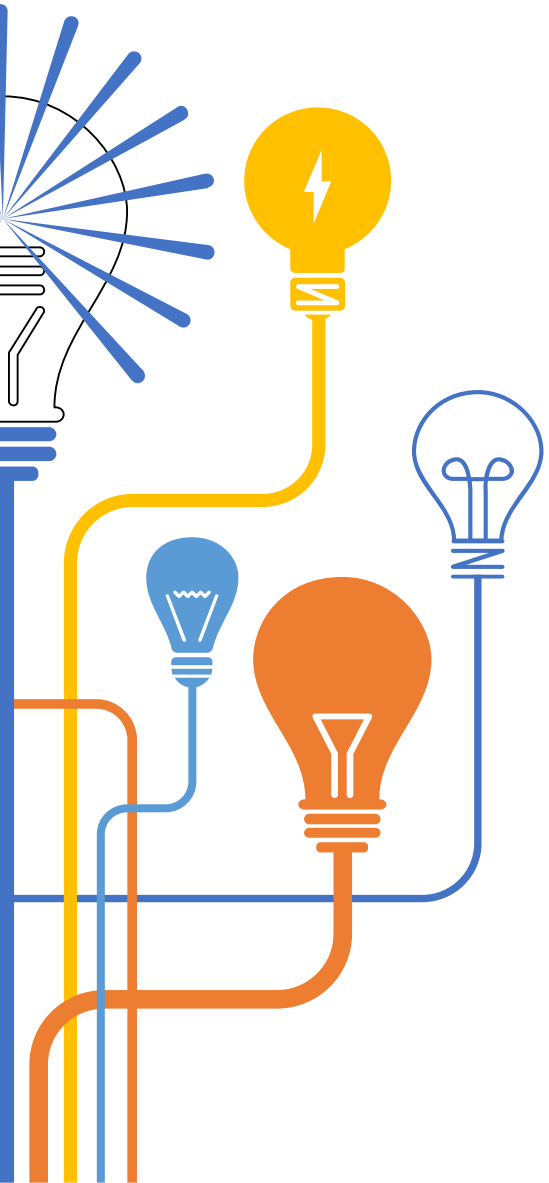
1. To determine which pests or diseases pose real or potential danger for the region.
2. To promote the adoption of common regional policies in agricultural health, and actions of prevention, control and/or eradication of agricultural pests and diseases of regional importance and interest.
3. To arrange agreements with international agencies and organizations regarding technical cooperation and financing for the development of projects of regional interest.
4. To coordinate actions with other countries and related organizations within and outside the region.

# Pest risk




**2517 Regulated quarantine pests**

# OIRSA Regional List of Regulated Pests

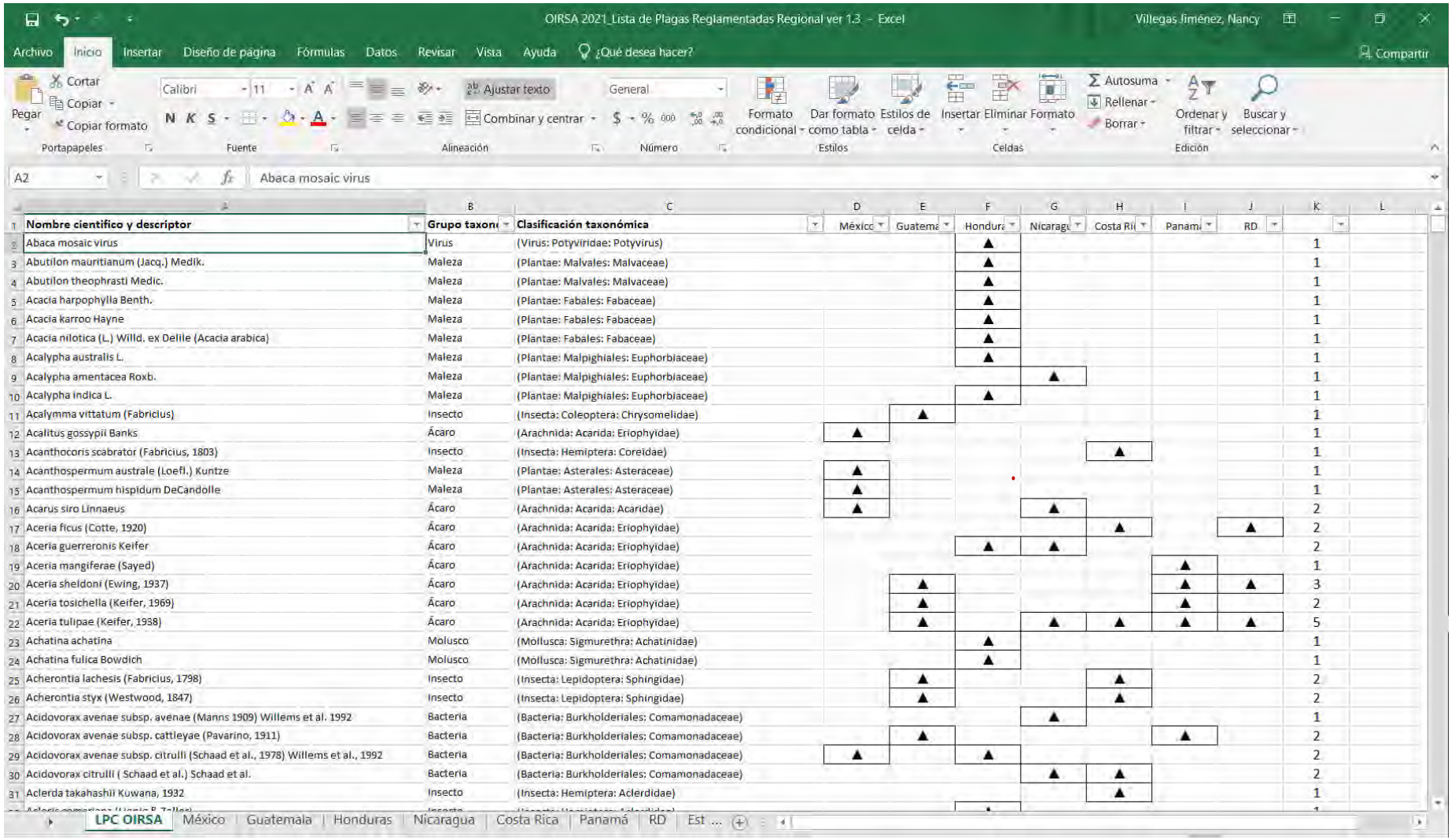


Last update:

**Mexico**. List of regulated pests of Mexico (IPPC, 2019).
**Guatemala**. Regulated pests of quarantine interest absent in the country and regulated pests present under official control (IPPC, 2016).
**Honduras**. List of quarantine pests and regulated pests for Honduras (SENASA, 2014).
**Nicaragua**. List of regulated pests of Nicaragua (IPPC, 2020).
**Costa Rica**. List of regulated pests of Costa Rica (IPPC, 2019).
**Panama**. Specific lists of regulated pests of Panama (IPPC, 2018).
**Dominican Republic**. List of regulated pests of the Dominican Republic (IPPC, 2020).

**The lists of Belize and El Salvador are in process with the support of OIRSA**

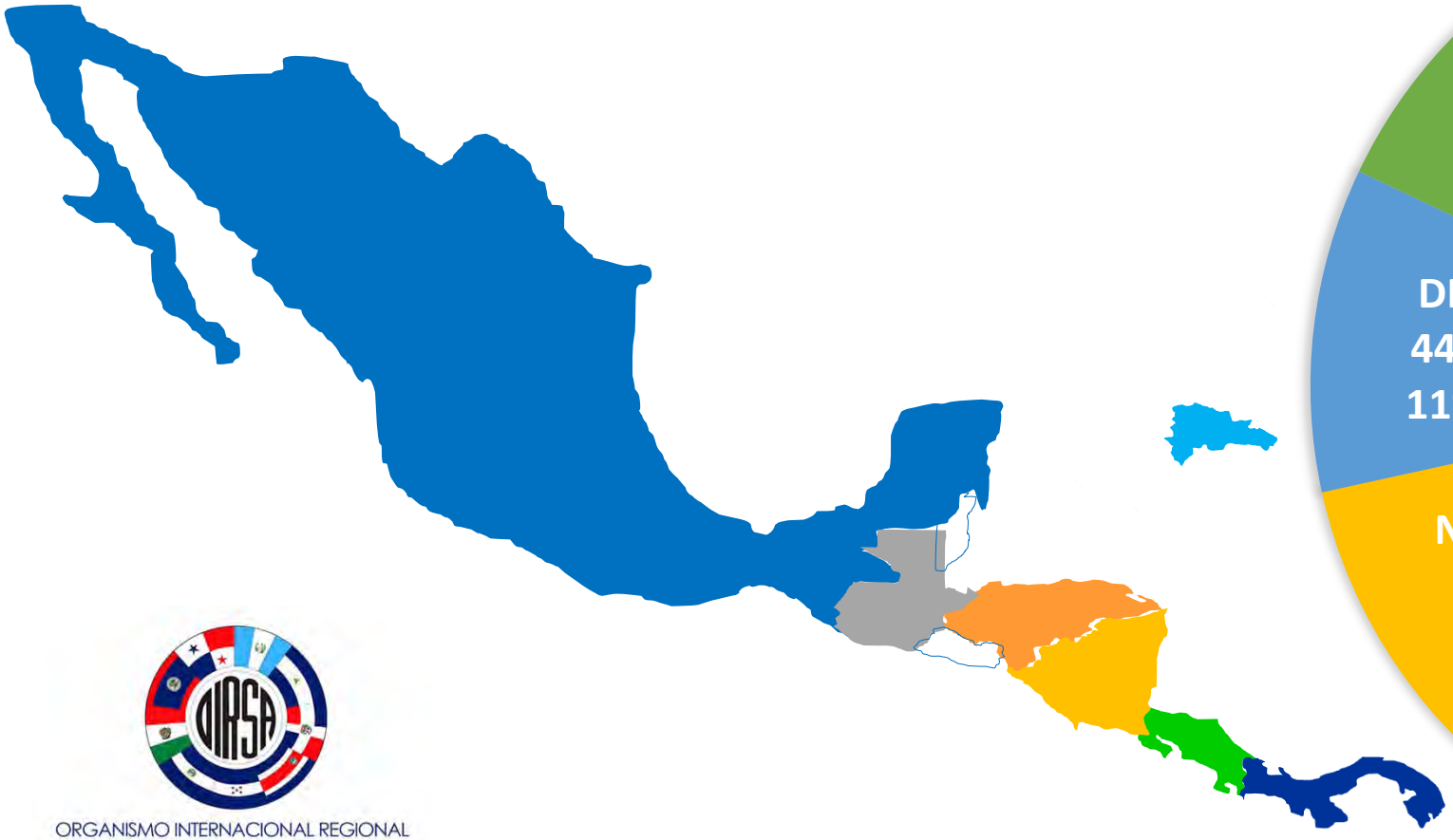
# OIRSA Regional List of Regulated Pests

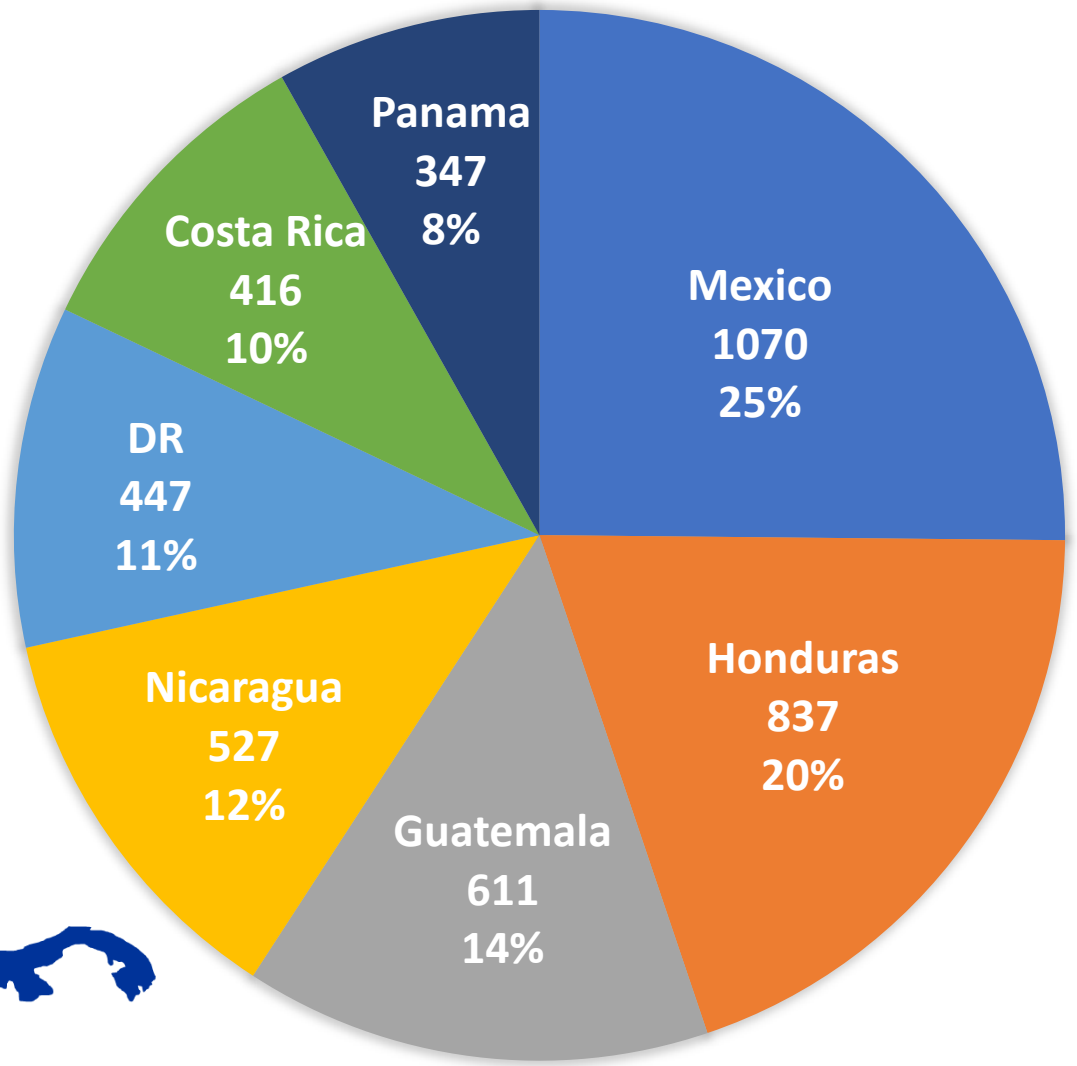



| | |
|---|---|
| 944 | Insects |
| 574 | Fungi |
| 411 | Weeds |
| 244 | Virus |
| 138 | Bacteria |
| 89 | Nematodes |
| 59 | Acari |
| 34 | Phytoplasma |
| 13 | Viroid |
| 11 | Mollusca |

**2517 Quarantine pest**

# No. Quarantine pests regulated by Country






ORGANISMO INTERNACIONAL REGIONAL
DE SANIDAD AGROPECUARIA

# Pest prioritisation

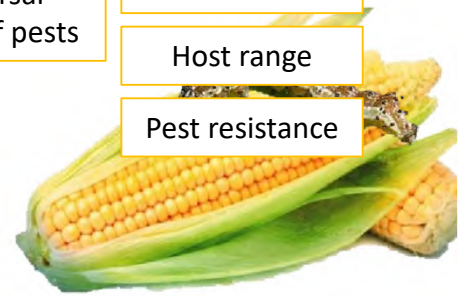
**What are priority pests?**

Priority pests are organisms characterized as pests, within the scope of the International Plant Protection Convention (IPPC), whose presence in any of the countries of the OIRSA region can cause losses and impacts on the economy, the environment or biodiversity, with social and even political repercussions .

The pests that are of interest to the common of all the Member States, are those of interest in their regional character, whether they are of quarantine interest (absent or present with restricted distribution and under official control), regulated for accessibility to export or present markets, and that due to their biological or epidemiological characteristics may change their habits when introduced to new environments and cause damage to agriculture or forestry.

# Prioritisation criteria

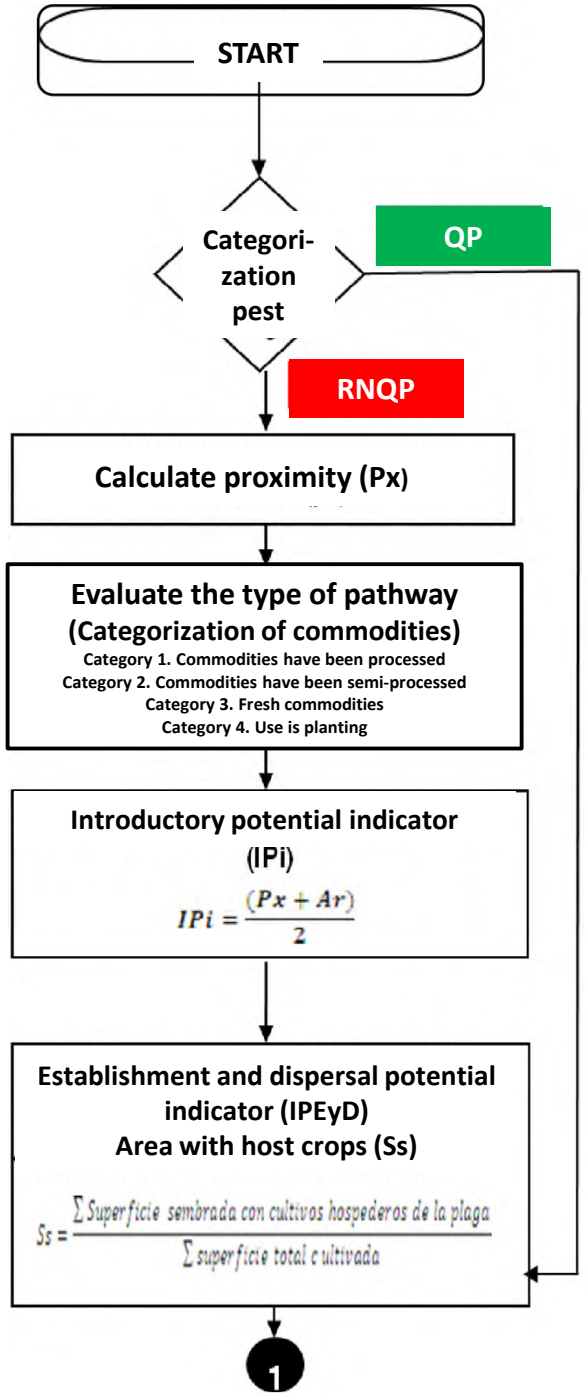
- **Probability of entry**
  - **Identification of pathways**
  - **Regulated article**
- **Probability of establishment**
  - Availability and distribution of hosts
  - Environmental suitability
- **Potential for economic, social and environmental consequences**
  - Environmental suitability
  - Environmental suitability
  - Environmental suitability
  - Environmental suitability
- **Biology of pests**
  - Reproductive biology
  - Tolerance environmental conditions
    - Growth rate or vigour
    - Host range
    - Pest resistance
  - Dispersal ability of pests
- **Total Risk**
  - Absence * (Ipi, IPE, Iceys, IB)
  - Presence (IPE, Iceus, IB)

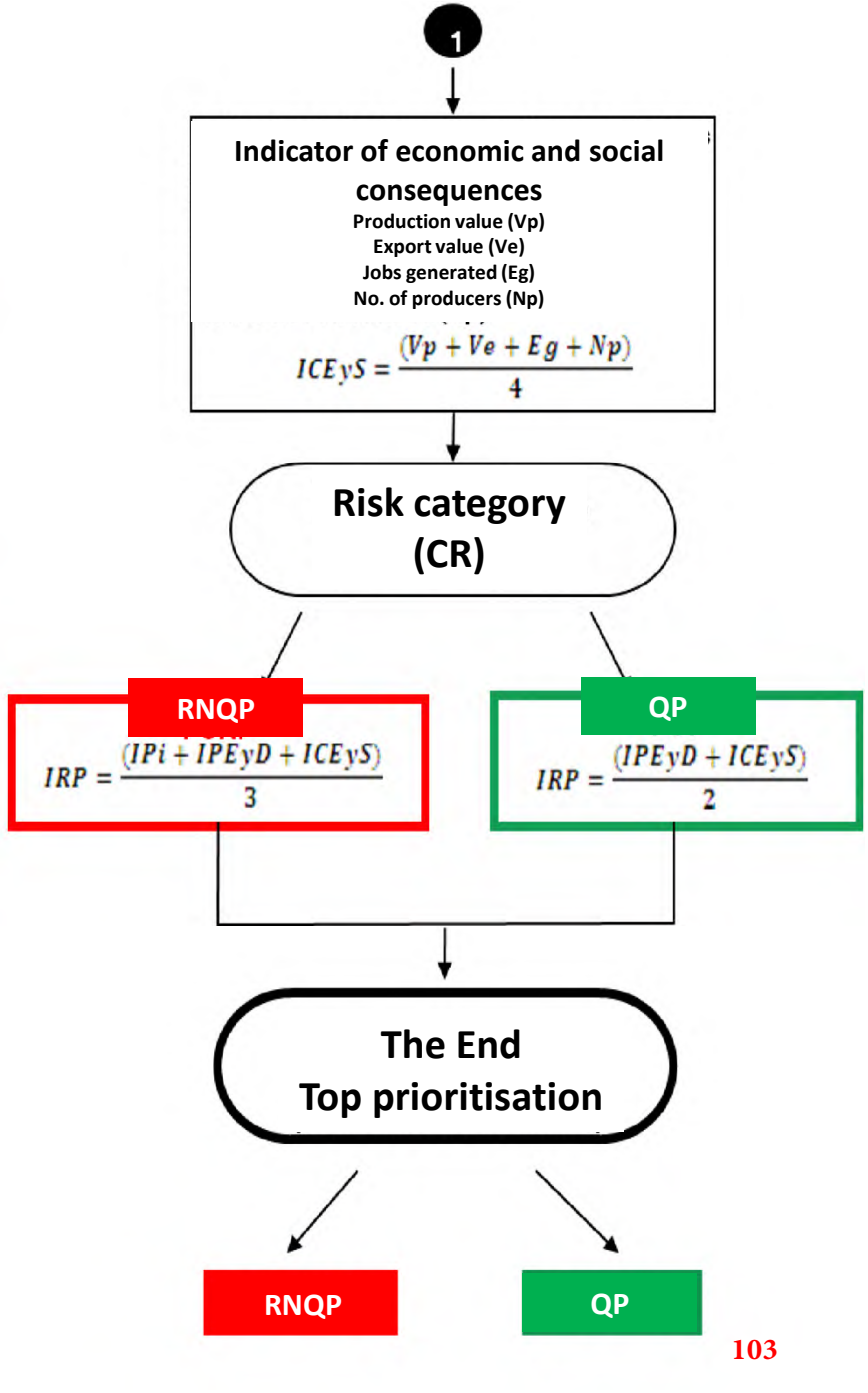


# Pest prioritisation criteria

## Model

- The main objective of a list of prioritised pests is to put OIRSA member countries on alert for attention and channelling resources.
- It is used by OIRSA to select potential pests for a Pest Risk Analysis (PRA).
- The proposed pests are prioritised based on the crops that have been identified as priorities for the region*
- The pests are then classified according to their "score" on the different criteria.



# Pest prioritisation…Work team

Regional Commission for Risk Analysis in Agricultural Health and Food Safety, plant health division

**Technical Direction**

Regional Directorate of Plant Health

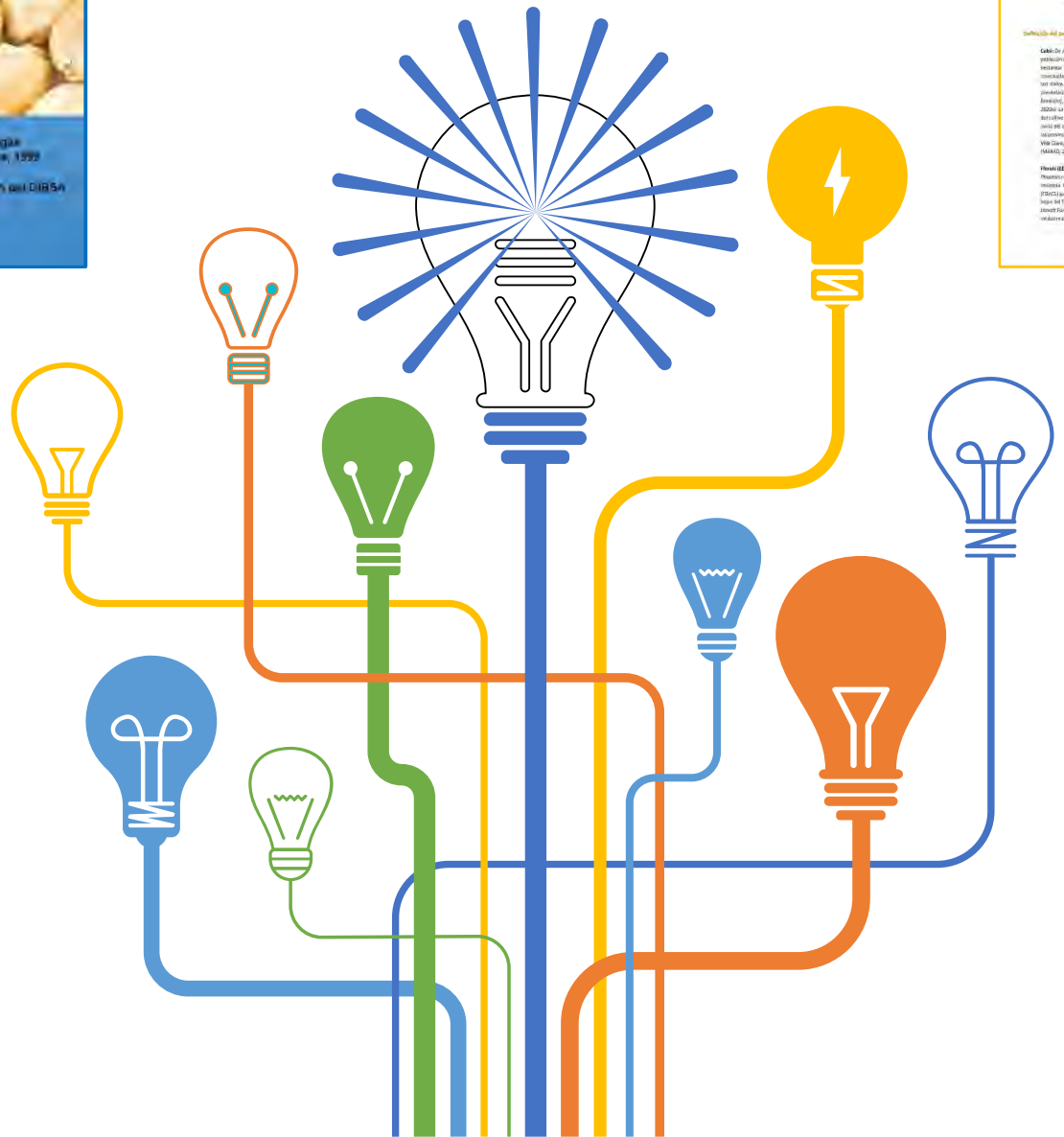
Regional Unit for Risk Analysis

Technical Panel on Plant Health (National Directors of NPPOs)

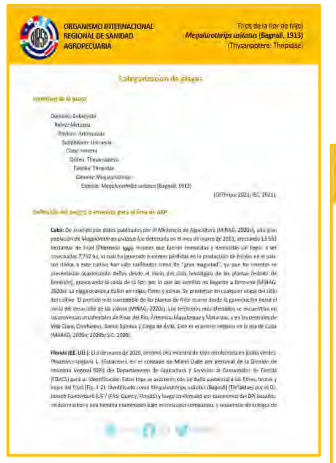
National Risk Analysis Units of the Member States

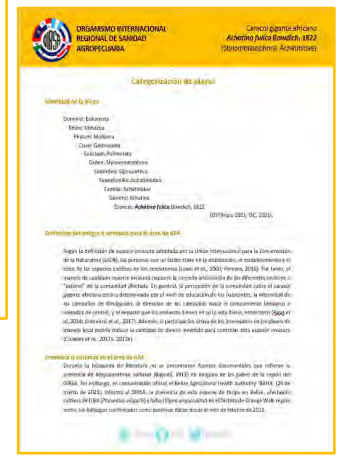
Pest Risk Analysis


# WEB



Pest categorisation






Pest Risk Assessment


Data sheet

# Priority regulated pests in OIRSA region

| I. Exotic fruit flies | | | |
|---|---|---|---|
| 1. | *Anastrepha grandis* | South American cucurbit fruit fly | Present with restricted distribution |
| 2. | *Anastrepha suspensa* | Caribbean fruit fly | Absent |
| 3. | *Bactrocera cucurbitae* | Melon fly | Absent |
| 4. | *Bactrocera dorsalis* | Oriental fruit fly | Absent |
| 5. | *Ceratitis capitata* | Mediterranean fruit fly | Present with restricted distribution |





# Priority regulated pests in OIRSA region

| | | |
|---|---|---|
| **II. Banana** | | |
| 6. *Fusarium oxysporum* f. sp. *cubense* Tropical Race 4 | Foc TR4 | Absent |
| 7. *Phyllosticta musarum* = *Guignardia musae* | Freckle disease of banana | Absent |
| 8. *Xanthomonas campestris* pv. *musacearum* | Banana xanthomonas wilt (BXW) | Absent |
| 9. *Banana bunchy top virus* | Bunchy top of banana (BBTV) | Absent |
| **III. Coffee** | | |
| 10. *Colletotrichum kahawae* | Coffee berry disease (CBD) | Absent |
| 11. *Hemileia vastatrix* | Coffee leaf rust | Reemerging |
| 12. *Xylella fastidiosa* | Coffee leaf scorch | Present with restricted distribution |

# Priority regulated pests in OIRSA region

| | | |
|---|---|---|
| | **VI. Coconut** | |
| 18. *Rhynchophorus ferrugineus* | Red palm weevil | Absent |
| | **VII. Cereals** | |
| *19. Helicoverpa armígera* | Cotton bollworm | Absent |
| *20. Spodoptera litura* | Taro caterpillar | Absent |
| 21. ***Trogoderma granarium*** | **Khapra beetle** | **Absent** |
| | **VIII. Legumes** | |
| 22. *Megalurothrips usitatus* | Bean flower thrips | Present with restricted distribution |
| | **IX. Solanaceae** | |
| 23. *Tuta absoluta* | Tomato Leafminer | Present with restricted distribution |
| 24. *Tomato brown rugose fruit virus* | ToBRFV | Present with restricted distribution |






# Priority regulated pests in OIRSA region

| | | |
|---|---|---|
| **X. Other pests** | | |
| 25. *Achatina* (=*Lissachatina*) *fulica* | Giant African land snail | Present with restricted distribution |
| 26. *Limantria dispar* | Gypsy moth | Absent |
| 27. *Schistocerca piceifrons piceifrons* | Central American Locust | Reemerging |
| **XI. Cocoa** | | |
| 28. | Frosty pod rot | Present with restricted distribution |
| **XII. Forest pests** | | |
| 29. *Dendroctonus* spp. | Complex debarkers | Reemerging |
| 30. *Ips* spp. | Complex debarkers | Reemerging |





# Possible entry (pathway)

Importation of contaminated regulated goods from countries with the presence of pests.

Mobilisation of unregulated items contaminated with unregulated pests (autostop).

Mobilisation of contaminated soil.


Unauthorized importation by passengers and international travelers

(bioterrorism)


Entry through international mail from countries with the presence of pests.


# Possible entry pathway

# Pest Risk Management


- Legal responsibility
- Detection, management and control
- Action plan (sampling, monitoring, identification, pest management, notification)
- Regional Epidemiological Surveillance Program

ORGANISMO INTERNACIONAL REGIONAL DE SANIDAD AGROPECUARIA


ANISMO INTERNACIONAL REGIONAL
DE SANIDAD AGROPECUARIA

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

# DOG BRIGADE – A SUCCESSFUL EXPERIENCE IN GUATEMALA

附件6

# ROLE OF DOGS

*Forensic Science: The Basics detector Dogs as Forensic tools

HISTORIC ROLE:

Protection

Hunting

- TODAY´S ROLE:

Companion

Integral part of life

- NEW ROLES:

Service dogs

Therapy dogs (Physical & Emotional support)

# OIRSA decided to introduce dog detectors:

- The first line of defence for keeping the region free of pests and diseases regulated by the governments
- FOC R4T, HLB, BSE, ASF, Foot and mouth disease, and Avian Influenza, just to mention some diseases.

# OIRSA decided to introduce dog detectors:

Canine detectors have an important role in fulfilling the mission to safeguard agriculture and natural resources.

Most of the economy of the countries of OIRSA region depends on agriculture.

# Non intrusive inspection.

- Canine Olfactory capacity 40 to 60 times more than humans
- Dogs perceive their world through the nose
- 95% accuracy in detecting products regulated by our region.
- More luggage inspected in less time. As many as 300 bags in 15 minutes.
- Better reaction from the passengers when the dog is sniffing.

# Intrusive inspection.

- Profile the passenger
- Humans perceive their world through the eyes
- Under 50% of effectiveness
- Spend at least 15 minutes inspecting one piece of luggage
- Causes discomfort and trouble to the people

# Backgrounds

The inspections at the airport used to be performed in an intrusive way, which means:

- Delays
- Disagreements with passengers

2018-OIRSA Signed a cooperation agreement with Mexico's government Canine School- for training dogs and handlers (canine teams / *binomios caninos*) to strengthen the quarantine services in the OIRSA Region

In coordination with Mexico, Guatemala started the recruitment staff selection, to start training the first team

Our first canine team, Odrix and Raul, started working at the Guatemala Airport by May 2018

# Handler profile

- The candidates should be Veterinarians, agronomist or of related professions.
- The candidate has to be in good shape and mild tempered
- The handler Students learn the fundamentals of canine healthcare
- Canine behaviour

# Detector dog features

- Dogs are rescued from streets and shelters, or donated by their owners.
- Age between 1 to 3 years.
- Friendly.
- Playful and treat lover
- Love food, greedy

# At the canine school

- There is a previous selection by the trainers of the detector dog candidate.
- The dog is evaluated :

By its temperament and behaviour,

and reaction to external issues.

- The dog is evaluated by a licenced veterinarian, and gets his health care and prophylactic plan (vaccines, deworming, flea and tick treatment)
- The dog stays in quarantine (diseases)
- The dog should be castrated before it starts the training at the school.

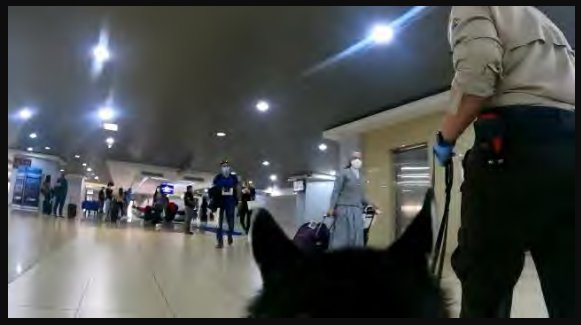
# At the Mexico canine school

- The canine school has a traditional theoretical class training
- The *handler* acquires skills by handling the canine to develop inspection techniques, through practical exercises in different scenarios for dogs.
- The dogs are trained to be able to work at airports, where the dogs detect forbidden products in luggage and on passengers; also at postal facilities at the cargo airport

# At the Mexico canine school


- The dogs are trained in basic obedience and common commands like: Sit, Where?, Show, Get it!!!!
- The training of the dogs last 120 days, for them to acquire the five basic odours with an advanced "hide and seek" game
- The 5 basic aromas are: mango, apple, citrus, beef, pork.
- Canine assignment. The dog and the handler have to get along well in order to create a strong bond between the dog and the handler: MATCH
- Finally the canine team is ready to workiiiiii

- The canine teams were equipped with a carry-on Go Pro camera for backing evidence in case of any incident with the passengers.
- In this video, during the interview the passenger realized that the dog had detected an issue in the luggage and....



This is what the dog sniffed out.
The seizure consisted in grains, seeds, roots, herbs, sweet potatoes.

It was around 5 kg. of confiscated products.

The detector dog sniffs out the luggage,  and goes directly to the target, and as a reaction, Odrix sat down to get the treat of her handler

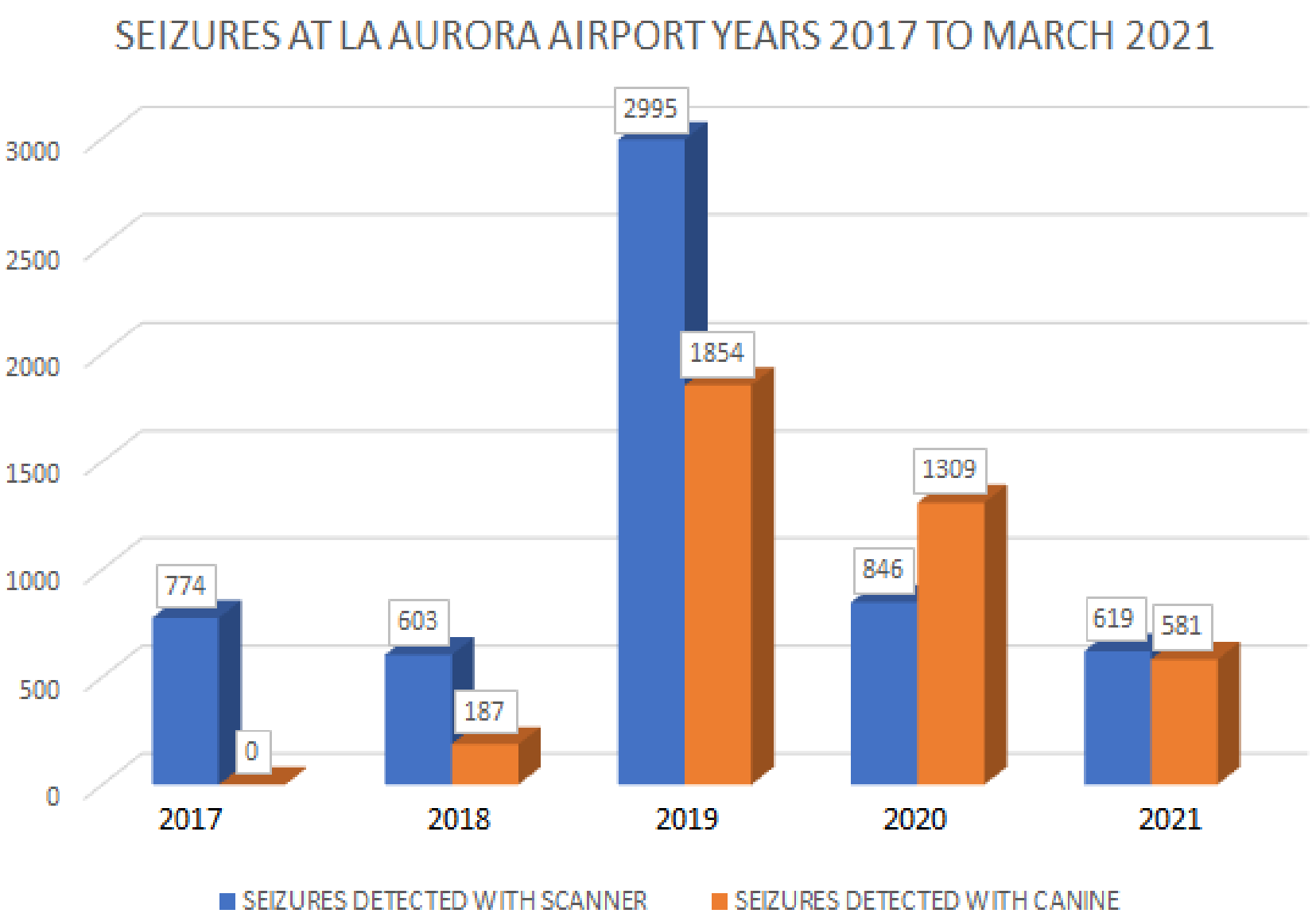
The odor was imprinted in the brain of the dog as a part of the hide and seek game; then, when he finds the target, he gets a reward that consists in a food treat

In this case, the passenger recognizes he has forbidden agriculture products and byproducts

The inspector proceeds to confiscate the product.

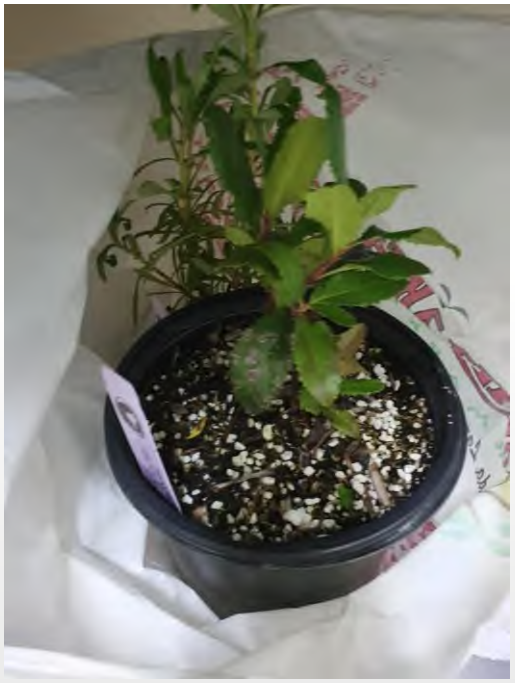
# Movil APP, and a Quarantine platform

- The information generated by the seizures, phytosanitary and sanitary measurements of agriculture products and byproducts, during the official inspection at the ports, airport and customs, generates official data in real time.

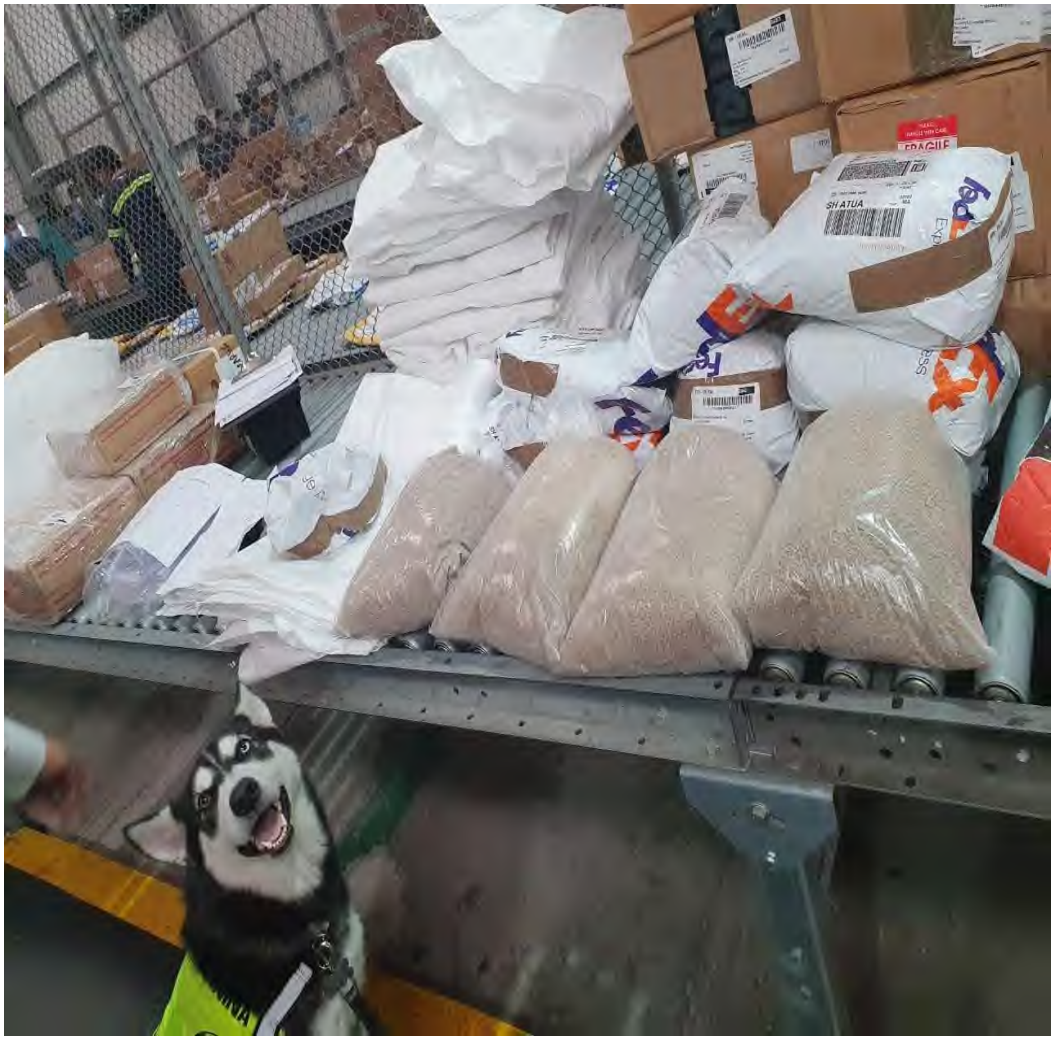

SEIZURES AT LA AURORA AIRPORT YEARS 2017 TO MARCH 2021
3000
2500
2000
1500
1000
500
0
774
0
603
187
2995
1854
846
1309
619
581
2017
2018
2019
2020
2021
SEIZURES DETECTED WITH SCANNER
SEIZURES DETECTED WITH CANINE

Most common detections by the canine teams. Guatemala


PRODUCTOS SIN
ACTA DE
DECOMISO
PRODUCTOS CON
ACTA DE
DECOMISO



# Seizures at the cargo and postal service



# Quarantine treatment of the seizure confiscated.

- They are disaggregated,
- Sprayed with a product (like gentian violet),
- The confiscated products go to the autoclave to be sterilized.

- In this video you can watch the autoclave handling of the seizures confiscated at the airport.
- The autoclave equipment works with vapour sterilizing the seizures, it has a
- Capacity of 3.8 $m^3$
- A temperature of 135 degree Celsius, for 45 minutes.

# THANK YOU VERY MUCH!!

# ¡MUCHAS GRACIAS !

附件7

# ProFume® and Vikane® Fumigant Stewardship Program & Quarantine Treatments for Brown Marmorated Stink Bug (*Halyomorpha halys*)

Dr. Barbara Nead-Nylander
SF Technical Expert
Global R&D
Douglas Products

DOUGLAS PRODUCTS

# History

- **1961** - Sulfuryl fluoride first marketed in United States as Vikane® fumigant by Dow Chemical for control of drywood termites and other structure infesting pests.
- **1992** – First use of Vikane in Europe (Germany) to control wood-boring beetles in historic churches.
- **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.



DOUGLAS PRODUCTS

# History

- **1995** – At the request of progressive food industries, Dow AgroSciences began investigation of sulfuryl fluoride as a methyl bromide alternative 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® fumigant.
- **2003** – First registration of ProFume (Switzerland).
- **Today** - ProFume is used to treat a **wide range of commodities** including cereal grains, dried fruit and tree nuts, herbs and spices, processed foods, dried vegetables, etc.

# Quarantine Applications

- Although not originally developed for use as a quarantine treatment, both Vikane® and ProFume® fumigants are used to fumigate various goods (vehicles, machinery, tile, wine barrels, wood products, etc.) exported to Australia and New Zealand for control of Brown Marmorated Stink Bug (BMSB) (*Halyomorpha halys*).
  - ProFume and Vikane are also used to treat logs exported to China.
  - ISPM treatment schedules for sulfuryl fluoride are available for wood packaging material and logs.
  - Sulfuryl fluoride is being considered for additional quarantine applications.

# What's up with Brown Marmorated Stink Bugs (BMSB)?

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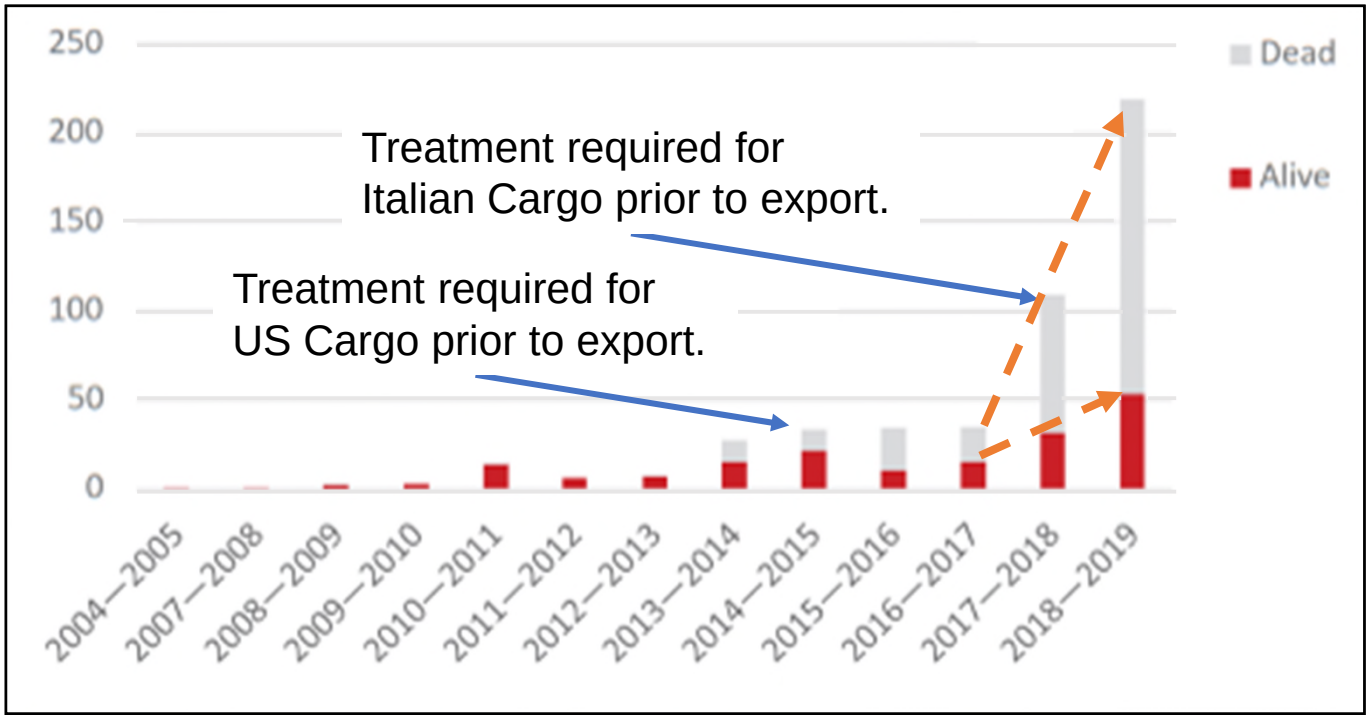
# Brown Marmorated Stink Bugs

BMSB is a quarantine pest (hitchhiker) for AUS and NZ. There are 3 approved quarantine treatment options, one of which is sulfuryl fluoride.

- Treatment is required during a specific timeframe that relates to the biology of the insect. Adults seek sheltered areas to overwinter (treatment is required Sept. 1 – April 30). During this timeframe, the insects are not actively feeding, and no oviposition is occurring.
- Shipping containers, vehicles, equipment being exported can harbor large numbers of BMSB during the Fall through Spring.

# Number of BMSB Incidents and Status By Season (AUS)



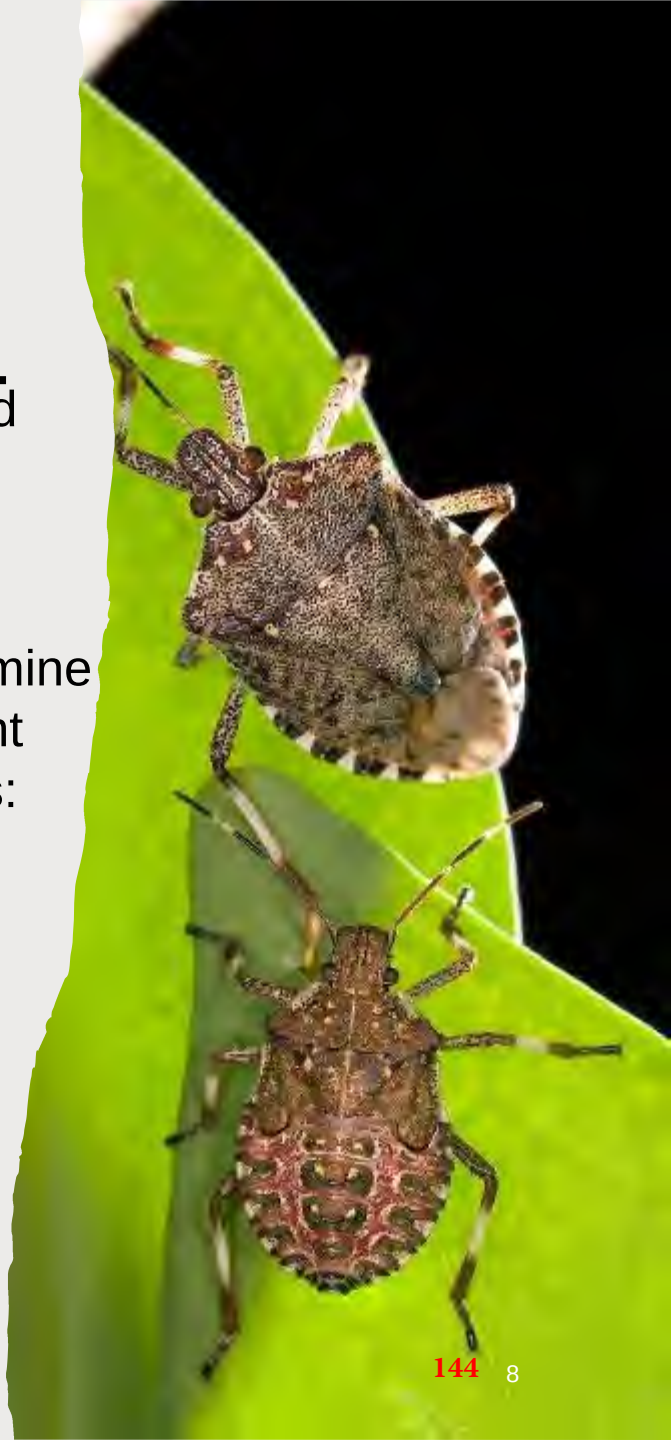

Graph from: March 2019 Connecting biological and trade data to managing the risk from *Halyomorpha halys*, brown marmorated stink bug (BMSB). Presentation by Brian Garms to US Fumigators (Australian Government Department of Agriculture and Water Resources).

# BMSB Quarantine Fumigations

In 2019, increased interceptions of BMSB in imported cargo raised concerns for AUS and NZ regulatory personnel.

As a result, Douglas Products and AUS Regulatory/Biosecurity personnel partnered to determine cause(s) of increase and then, identify and implement solutions. Douglas Products took the following steps:

- Arranged for AUS/NZ regulatory personnel to view port fumigations and meet with fumigators in both EU and US.
- Discussed with AUS Biosecurity possible solutions to ensure SF is used appropriately and treatments are being made as required.
- Incorporated training for BMSB applications into annual stewardship program.
- Developed specific training for SF container and automobile fumigations.



# Why A Product Stewardship Program?

- Sulfuryl fluoride is a colorless, odorless gas at concentrations used in fumigations. It is not irritating to skin or eyes.
  - Users must be licensed for fumigation and meet established requirements of the Douglas Products stewardship program to purchase and use Vikane® and ProFume®.
- Sulfuryl fluoride has been successfully used to control pests for over 60 years and product stewardship programs and activities associated with Vikane and ProFume have evolved over this time.
  - Product stewardship efforts have been an integral part of maintaining continued effective use of these fumigants.

# Product Stewardship Program

- The Program is not static – it is updated continuously to meet industry needs.

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- The Program is not static – it is updated continuously to meet industry needs.
- The Program is tailored to meet needs of a specific country, region or product use pattern.

# Product Stewardship Program

- The Program is not static – it is updated continuously to meet industry needs.
- The Program is tailored to meet needs of a specific country, region or product.
- **The Program compliments regulatory oversight – does not replace it.**

# Stewardship Program Objectives

- Focus on safety
- Prevent human injury – fumigator, fumigation workers, customers, and the public
- Maintain fumigation with sulfuryl fluoride as an effective way to eliminate target pests
- Help fumigators address customer and consumer questions
- Minimize, mitigate and manage risk



DOUGLAS PRODUCTS

# Stewardship Program Components

1. **Written stewardship policy for distributors and fumigators**
2. Initial and annual stewardship training
3. Additional training programs
4. Quality Assurance Reviews/On-Site Observation
5. Stewardship compliance policies
6. Product integrity – sulfuryl fluoride and cylinder fleet management
7. Cylinder tracking
8. Emergency response
9. Customer Information Group
10. Technical support
11. Fumiguide™ System

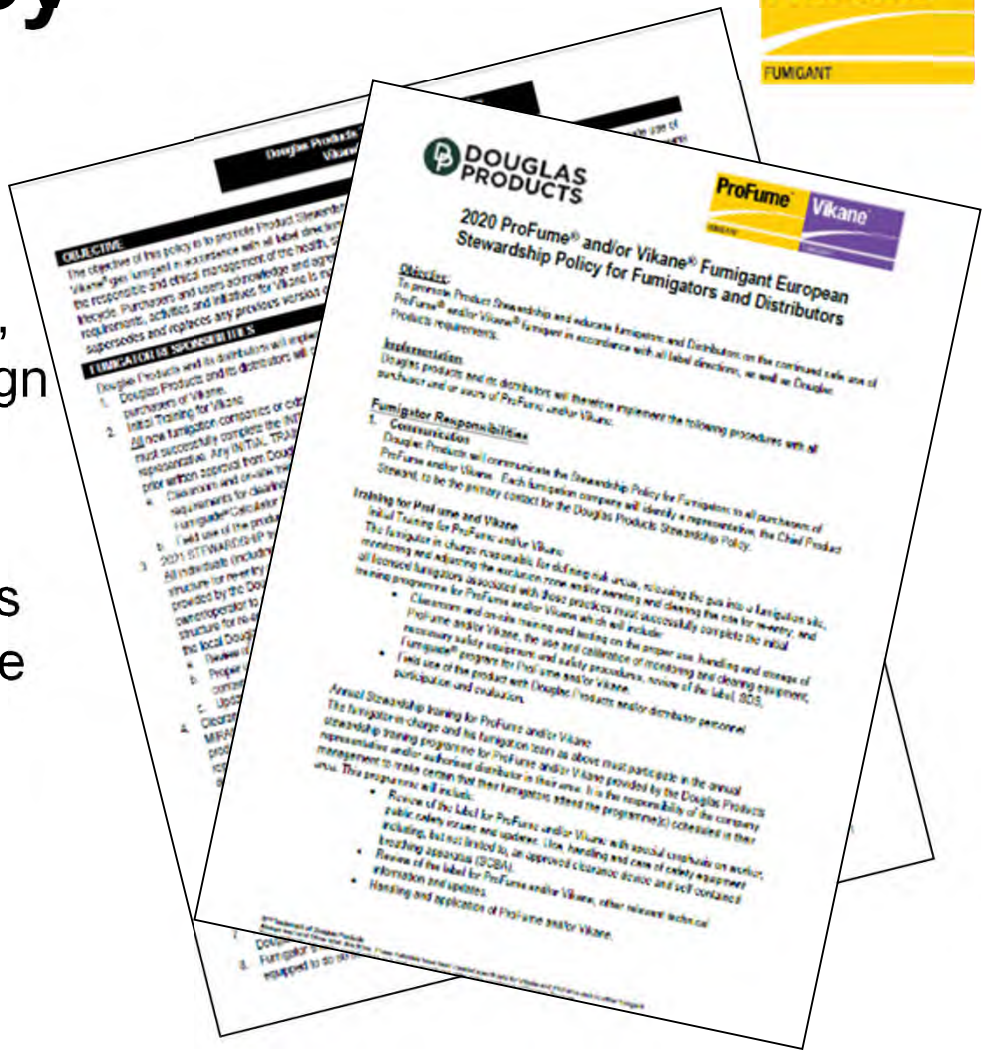
# Distributor and Fumigator Stewardship Policy

To promote product stewardship and educate fumigators on the continued use of Vikane® and ProFume® fumigants in accordance with label directions as well as requirements from Douglas Products.

# Distributor and Fumigator Stewardship Policy

Policies may vary slightly by country, but all policies require the following:

- To purchase Vikane® or ProFume®, distributors and fumigators must sign and follow a written stewardship policy for each fumigant.
- Failure to comply with requirements stated in the policy may result in the loss of the ability to purchase and use Vikane or ProFume fumigants.



# Stewardship Program Components Addressing BMSB

1. Written stewardship policy for distributors and fumigators
2. Initial training (New users of Vikane® and/or ProFume®)
3. **Annual Stewardship Training (Existing users of Vikane and ProFume)**
4. Additional training programs
5. Quality Assurance Reviews/On-Site Observation
6. Stewardship compliance policies
7. Product integrity – sulfuryl fluoride and cylinder fleet management
8. Cylinder tracking
9. Emergency response
10. Customer Information Group
11. Technical support
12. Fumiguide™ System

# Annual Stewardship Training

Application personnel for Vikane® or ProFume® must participate in annual recurrent training which reviews:

- Stewardship policy
- Use of safety equipment and procedures
- Cylinder handling
- Emergency response and risk mitigation
- Best Practices
- **Any new developments – policies, procedures, labeling changes, equipment, federal, state and local regulations**

# Annual Stewardship Training

The 2-hour training course is conducted by live instruction and includes:

- Hand-outs
- Audience participation activities
- Final quiz

Training program qualifies for Continuing Education Units (CEUs) if needed to maintain licensing.

# Annual Stewardship Training

Development of annual stewardship training for Vikane® and ProFume® fumigants:

- Program content developed by Douglas Products technical and commercial personnel responsible for Vikane and ProFume.
  - Input and information from fumigators, distributors, regulators, industry associations and other experts.
- Presentations are developed by personnel with expertise in adult education programs.
- Program is reviewed with Douglas Products' representatives tasked with delivery of the training to ensure understanding.

# Annual Stewardship Training

Two main sections based on material covered:

- **Annually covered** to meet label and stewardship policy requirements: Stewardship policy, use of safety equipment and procedures, cylinder handling, emergency response and risk mitigation, Best Practices, and new developments.
- **Variable content** to meet specific geographical or regional needs. These topics are based on feedback from users, DP sales personnel, DP technical personnel and other stakeholders.

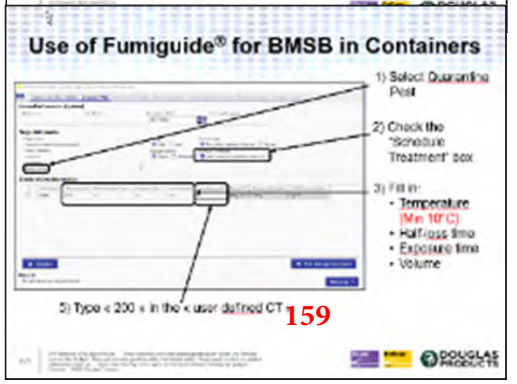
# Annual Stewardship Training: Variable Content

- Topics vary based on needs:
  - Preparation for residential fumigations.
  - Proper selection of introduction equipment.
  - Best practices for monitoring.
  - Dealing with connected structures.
  - **BMSB quarantine treatments.**

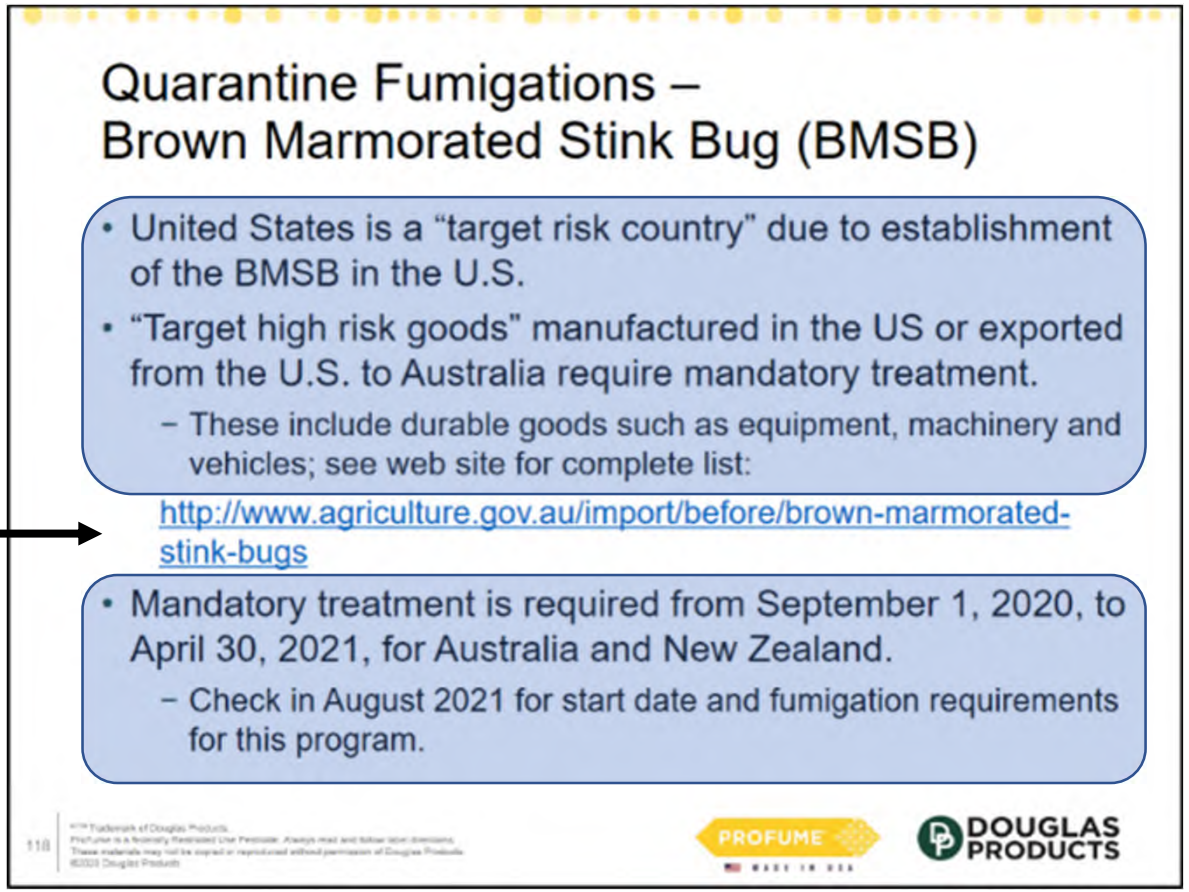
# Annual Stewardship Training Variable Content: BMSB Fumigations

- Review AUS requirements for fumigator registration.
- Remind fumigators to confirm treatment schedules and procedures.
- Review additional documentation.
- Review fumigation requirements for monitoring.
- Review any additional or new requirements associated with BMSB treatments.
- Review use of Fumiguide™ with BMSB treatments.



# Annual Stewardship Training
# Variable Content: BMSB Fumigations



# Annual Stewardship Training
# Variable Content: BMSB Fumigations

## Sulfuryl fluoride (ProFume® gas fumigant) treatment schedule for BMSB

| Temperature | Exposure Period | Minimum Initial Concentration | Minimum Ending Concentration |
|---|---|---|---|
| 10° C or above | Minimum of 12 hours but less than 24 hours | 24 g/m³ | 12 g/m³ |
| 10° C or above | 24 hours or longer | 24 g/m³ | 8 g/m³ |

- Dose increases to compensate for temperatures less than 10°C is NOT permitted.
- Topping up with additional fumigant at the end of treatment is NOT permitted.
- If the concentration of fumigant falls below the minimum end point reading at any point during the treatment, the treatment has failed.

## Sulfuryl fluoride (ProFume® gas fumigant) treatment schedule for BMSB

| Temperature | Exposure Period | Required Dosage (g-h/m³) | Minimum Ending Concentration |
|---|---|---|---|
| 10° C or above | Minimum of 12 hours but less than 24 hours | 200 | 12 g/m³ |
| 10° C or above | 24 hours or longer | 200 | 8 g/m³ |

- Douglas Products ProFume Fumiguide® program is an "approved third party system."
- The Fumiguide can be used to record monitoring readings and calculate total accumulated CT.

# Annual Stewardship Training
# Variable Content: BMSB Fumigations

Vikane FUMIGANT ProFume FUMIGANT

## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

- Minimum standards described in "Sulfuryl fluoride fumigation methodology" (25 pages), includes:
  - Preparation
  - Dose Calculation
  - Initial and Top-up Application
  - Monitoring
  - Aeration
  - Documentation
- Download sulfuryl fluoride treatment documents from the web site:


http://www.agriculture.gov.au/import/arrival/treatments/treatments-fumigants#sulfuryl-fluoride-fumigation

PROFUME DOUGLAS PRODUCTS

## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

It is important to carefully **read and follow requirements** in "Sulfuryl fluoride fumigation methodology."

- Exception: These methods are based on labeling requirements for ProFume® gas fumigant and national regulations in Australia.
- For U.S. fumigators, U.S. labeling and state and USDA-PPQ requirements must be followed if more restrictive.
- Example: Fumigated enclosures must be aerated to 1 ppm or less, not to 3 ppm as referenced in the Australian methods.

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# Annual Stewardship Training
# Variable Content: BMSB Fumigations

## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

Regarding documentation, two documents are required for each fumigation.

1. Fill out the Record of Fumigation as the fumigation is being conducted! The form is provided on the web site.

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## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

BROWN MARMORATED STINK BUG SULFURYL FLUORIDE FUMIGATION CERTIFICATE

2. Fumigation Certificate (form provided on the web site).

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DOUGLAS PRODUCTS

# Annual Stewardship Training
# Variable Content: BMSB Fumigations

## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

Australian Government
Department of Agriculture, Water and the Environment

**How to complete the Australian Department of Agriculture, Water and the Environment Approved Sulfuryl Fluoride Fumigation Certificate**

Only fumigation certificates from companies listed as 'acceptable' on the department's approved list of offshore BMSB treatment providers [approved list] will be accepted by the department.

The following details relating to sulfuryl fluoride fumigations must be included on the fumigation certificate for it to be accepted by the department. This information should be on a single page and in a format consistent with the fumigation certificate template provided on the department's website.

**Certificate must be on the treatment provider's letterhead**

The letterhead must include the address of the fumigation treatment provider that matches the address published on the approved list. Where a company has more than one branch, the address on the letterhead must match that on the approved list for the branch that issues the certificate.

**Certificate Number**

Each certificate must include a unique certificate number issued by the treatment provider. For audit and investigation purposes the certificate number must link to the treatment provider's fumigation records for the treatment covered by the certificate.

**Target of the Fumigation Details**

[select the option that best describes the target of the fumigation. This may be the commodity [goods], the non-commodity (including packaging and/or container) or both.

**AEI**

Each certificate must include the unique AEI number they are assigned by the department. All companies listed as acceptable on the approved list are issued an AEI number. Each AEI number includes a two-character country code, a four-digit company identification number, and a two letter treatment code.

**Target Description**

Provide a short summary of the target of the fumigation. For example, 'agricultural machinery'.

**Consignment Link**

The certificate must include a link to some other official documentation related to the consignment such as: a bill of lading number, a commercial invoice number, a preferential tariff certificate number, a packing list number or container number. If there is insufficient room on the certificate you may use the additional declarations field or attach a complete list to the certificate.

**Consignment Details**

The certificate must also include the quantity, the country of origin, the intended port of loading and country of destination, as well as the name and addresses of the exporter and importer.

- Detailed description on how to fill-out the fumigation certificate is provided on the web site.
- Common question: "Final TLV reading" on fumigation certificate is the final clearance reading.
  - This should be 1 ppm or less based on requirements of the U.S. labeling for ProFume® gas fumigant.

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# Annual Stewardship Training
# Variable Content: BMSB Fumigations

Vikane FUMIGANT ProFume FUMIGANT

## Quarantine Fumigations – Brown Marmorated Stink Bug (BMSB)

- U.S. Fumigators must register each year with Australian authorities to conduct the mandatory treatments of target high risk goods exported to Australia.
- Requirements for registering are at the web site (**updated June 2020**):

  http://www.agriculture.gov.au/import/before/brown-marmorated-stink-bugs/offshore-bmsb-treatment-providers-scheme

  - Summary of key changes to the Offshore BMSB Treatment Providers Scheme also found on this site.


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Review requirements for registering for fumigation companies which had previously registered and for companies who have never registered.

Make sure participants understand due dates.



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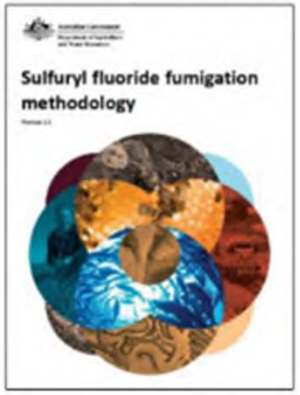
# Annual Stewardship Training Variable Content: BMSB Fumigations

## Fumigations de quarantaine – Punaise diabolique -Brown Marmorated Stink Bug (BMSB) )

- Les normes minimales décrites dans la « méthode de fumigation du fluorure de sulfuryl » (25 pages) comprennent :
  - Préparation
  - Calcul de la dose
  - Application initiale et recharge vers le haut
  - Surveillance
  - Aération
  - Documentation
- Télécharger le traitement au fluorure de sulfuryl
- documents du site Web :
- http://www.agriculture.gov.au/import/arrival/treatments/treatments-fumigants#sulfuryl-fluoride-fumigation

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This information is included in Annual Stewardship Training Programs in countries where this application is mandated.

# Stewardship Program Components Addressing BMSB

1. Written stewardship policy for distributors and fumigators
2. Initial training (New users of Vikane® and/or ProFume®)
3. Annual Stewardship Training (Existing users of Vikane and ProFume)
4. **Additional training programs**
5. Quality Assurance Reviews/On-Site Observation
6. Stewardship compliance policies
7. Product integrity – sulfuryl fluoride and cylinder fleet management
8. Cylinder tracking
9. Emergency response
10. Customer Information Group
11. Technical support
12. Fumiguide™ System

# Additional Training Programs

- Content is targeted to meet participant specific needs.
- Allows participants to focus on topic.
- Sessions include both classroom and hands-on demonstrations.
- May run for 1-2 hours to 1-2 days depending on topics and participant needs.

# Additional Training Programs


## University Hosted Pest Management Workshops/Conferences:

- Florida A&M University: PCO Workshop
- University of Florida: Southeast Pest Management Conference
- Kansas State University: Pest Management Conference
- University of California Riverside: Pest Management Conference
- Purdue University: Pest Management Conference

## Pest Control Association Meetings and Workshops:

- National Pest Management Association
- Florida Pest Management Association, Certified Pest Control Operators of Florida
- Pest Control Operators of California
- Hawaii Pest Control Association
- Georgia Pest Control Association
- North Carolina Pest Control Association

## Specific Education Programs for Fumigation Companies:

- More than 25 programs conducted on dosage calculation, graphing, general preparation, aeration procedures, clearance testing, fumigation for bed bug control, special fumigations (e.g., vehicles, container fumigations for BMSB quarantine treatments).



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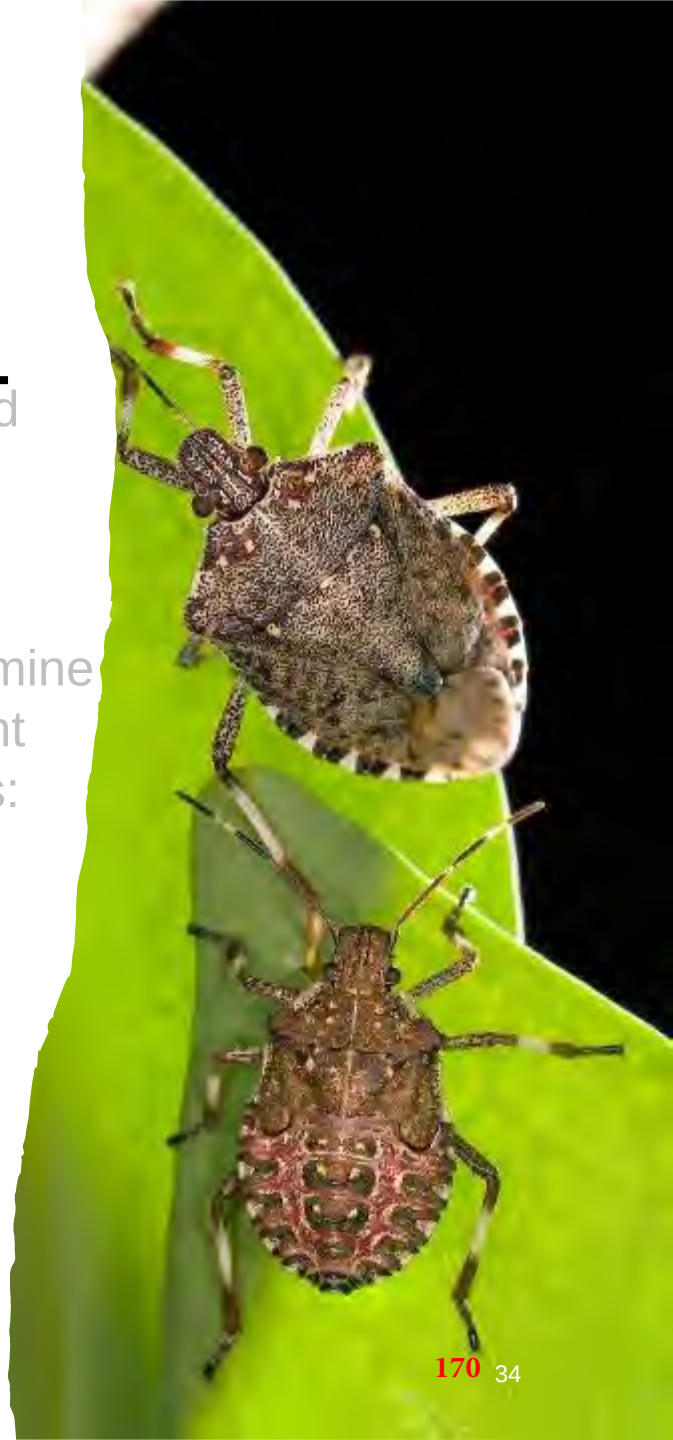
# BMSB Quarantine Fumigations

In 2019, increased interceptions of BMSB in imported cargo raised concerns for AUS and NZ regulatory personnel.

As a result, Douglas Products and AUS Regulatory/Biosecurity personnel partnered to determine cause(s) of increase and then, identify and implement solutions. Douglas Products took the following steps:

- Arranged for AUS/NZ regulatory personnel to view port fumigations and meet with fumigators in both EU and US.
- Discussed with AUS Biosecurity possible solutions to ensure SF is used appropriately and treatments are being made as required.
- Incorporated training for BMSB applications into annual stewardship program.
- **Developed specific training for SF container and automobile fumigations.**



# Additional Training Programs: Vehicle Fumigations for BMSB

Review critical components for an effective fumigation including preparation, monitoring, and aeration.

Safety reminders.

## Automobiles & Equipment

**Vehicle preparation**

- Vehicle should be clean and reasonably dry
- At least one window, if present and operational, should be opened a minimum of 3 inches
- Large compartments, such as trunks and passenger compartments, must be inspected prior to fumigation to ensure they have been vacated by all people, domestic animals and pets

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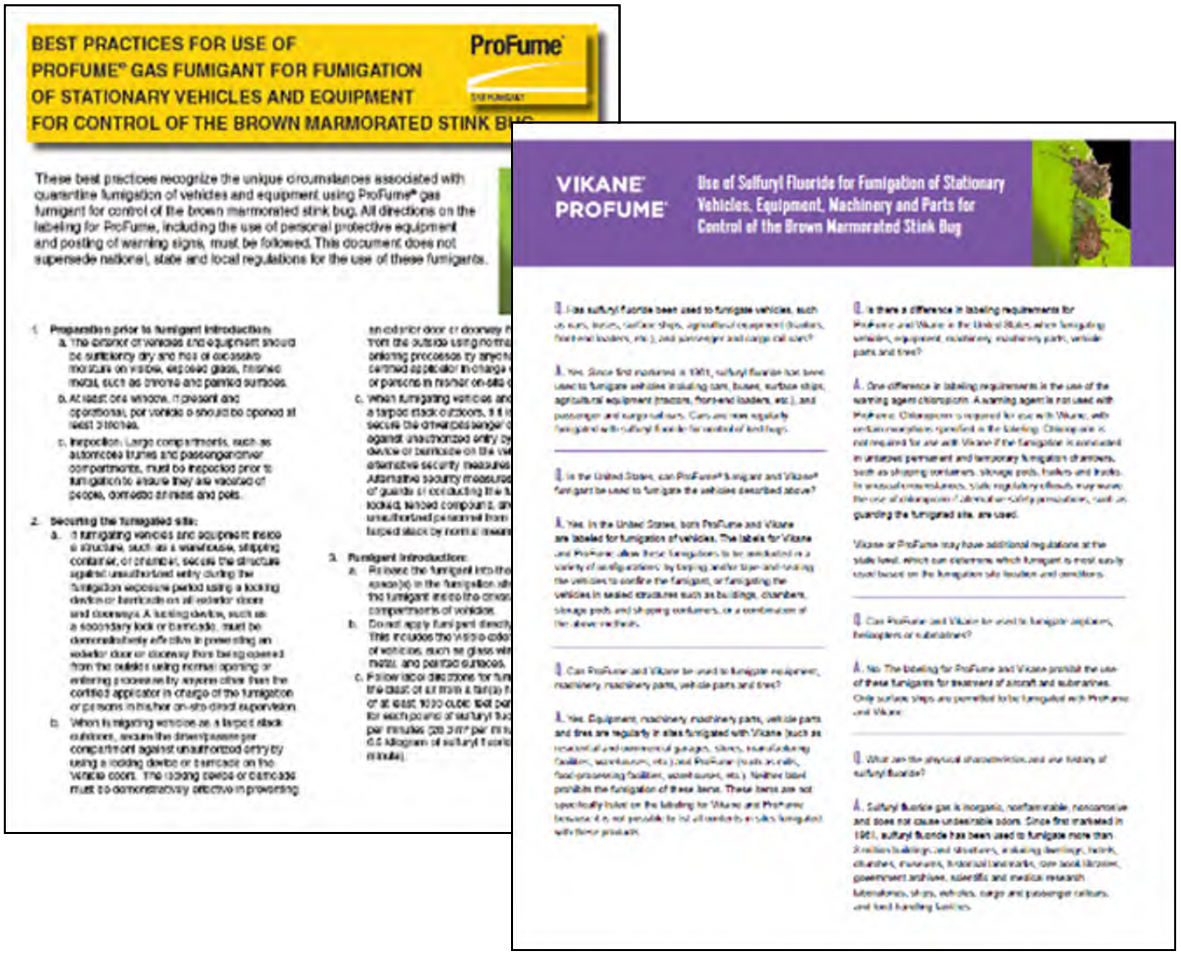
# Additional Training Programs: Vehicle Fumigations for BMSB


BEST PRACTICES FOR USE OF PROFUME® GAS FUMIGANT FOR FUMIGATION OF STATIONARY VEHICLES AND EQUIPMENT FOR CONTROL OF THE BROWN MARMORATED STINK BUG

ProFume

These best practices recognize the unique circumstances associated with quarantine fumigation of vehicles and equipment using ProFume® gas fumigant for control of the brown marmorated stink bug. All directions on the labeling for ProFume, including the use of personal protective equipment and posting of warning signs, must be followed. This document does not supersede national, state and local regulations for the use of these fumigants.

VIKANE® PROFUME®

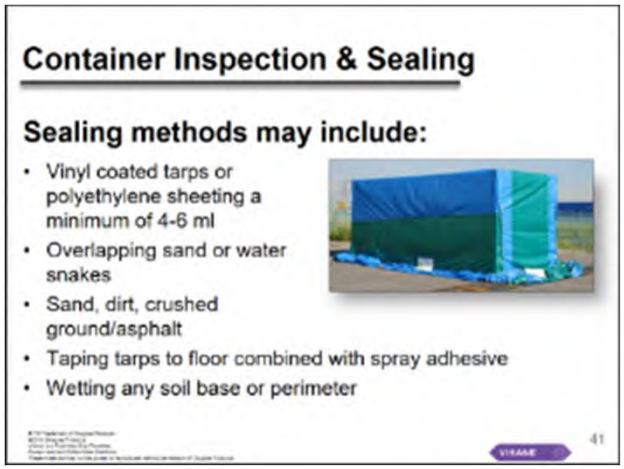
Use of Sulfuryl Fluoride for Fumigation of Stationary Vehicles, Equipment, Machinery and Parts for Control of the Brown Marmorated Stink Bug

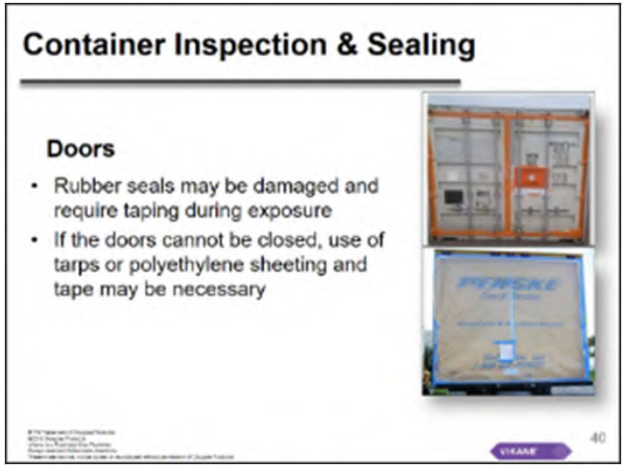
In addition to presentations and discussion, literature pieces are available to fumigators and fumigations companies to use internally or with customers.

These are provided by Douglas Products upon request to our customers at no cost.

## Additional Training Programs: Container Fumigations for BMSB

- Best Practices for Sealing using Tape and Seal or Tarp methods.
- Best Practices for aeration.
- Review monitoring line placement requirements.




# Development of BMSB Training

- All content is reviewed annually and updated to reflect most recent information available.
- Annual stewardship content is developed in the summer months for release in the following year.
  - We are working on the 2022 annual training now.
- Open communication between Stakeholders such as AUS Regulatory/ Biosecurity Personnel and Douglas Products allows us to provide ProFume® and Vikane® users the most current information to address concerns and ensure the product is used  appropriately and remains effective.

# Summary

- The ongoing partnership between AUS Regulatory/Biosecurity personnel has been critical to the identification and implementation of successful solutions to addressing issues and concerns associated with quarantine treatments for BMSB control.
- The stewardship annual training included in the larger stewardship program provides an opportunity to address current needs associated with a geography, region or use pattern.
- Additional training programs offered by Douglas Products to specific fumigation companies allows for delivery and reinforcement of targeted information helping to ensure compliance with requirements associated with sulfuryl fluoride use in BMSB quarantine applications.