

PLANT BIOSECURITY & OIL PALM EXOTIC DISEASES



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BREAKING NEWS



**TERSELUDUP EPAL,
PELAKON UMIE AIDA DIDENDA OLEH
PIHAK BERKUASA DI NEW ZEALAND!**



WHAT IS BIOSECURITY?

- Biosecurity refers to a set of **measures**, **protocols**, and **strategies** designed to **prevent**, **manage**, and **respond** to the risks of pests, diseases, invasive species, or biological threats that could harm plants, animals, humans, or the environment.
- **Malaysia's National Quarantine** system help to prevent introduction of harmful exotic pests and diseases into the country.
- **Sanitary and Phytosanitary (SPS)** measures are biosecurity and quarantine rules that help prevent the spread of pests, diseases, and harmful organisms through trade.



Jabatan Perkhidmatan
Kuarantin & Pemeriksaan
Malaysia



Agensi Kawalan dan
Perlindungan Sempadan
Malaysia

PLANT QUARANTINE ACT & REGULATIONS IN MALAYSIA



PLANT QUARANTINE ACT 1976 (ACT 167)

Malaysia's key legislation to prevent the entry and spread of plant pests and diseases. It regulates the import, export, inspection, treatment, and destruction of plants and plant products, ensuring national biosecurity while supporting safe and compliant international trade in agriculture.

PLANT QUARANTINE REGULATIONS 1981

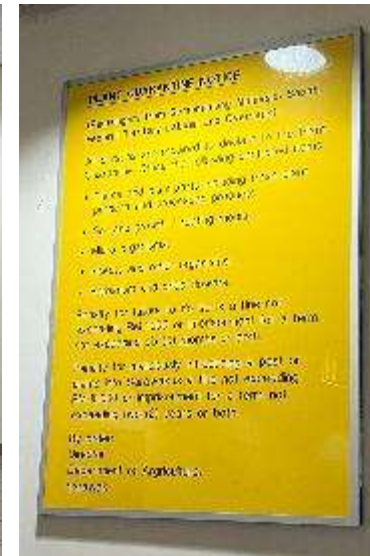
Subsidiary regulations under the Plant Quarantine Act 1976 (Act 167) that provide detailed enforcement procedures. They define import/export requirements, lists of prohibited items, inspection protocols, quarantine treatments, and post-entry quarantine. These regulations ensure effective plant health control at entry points and support compliance with international phytosanitary standards.

PLANT BIOSECURITY ACTS & REGULATIONS IN MALAYSIA

The Agencies



Agensi Kawalan dan
Pertindungan Sempadan
Malaysia

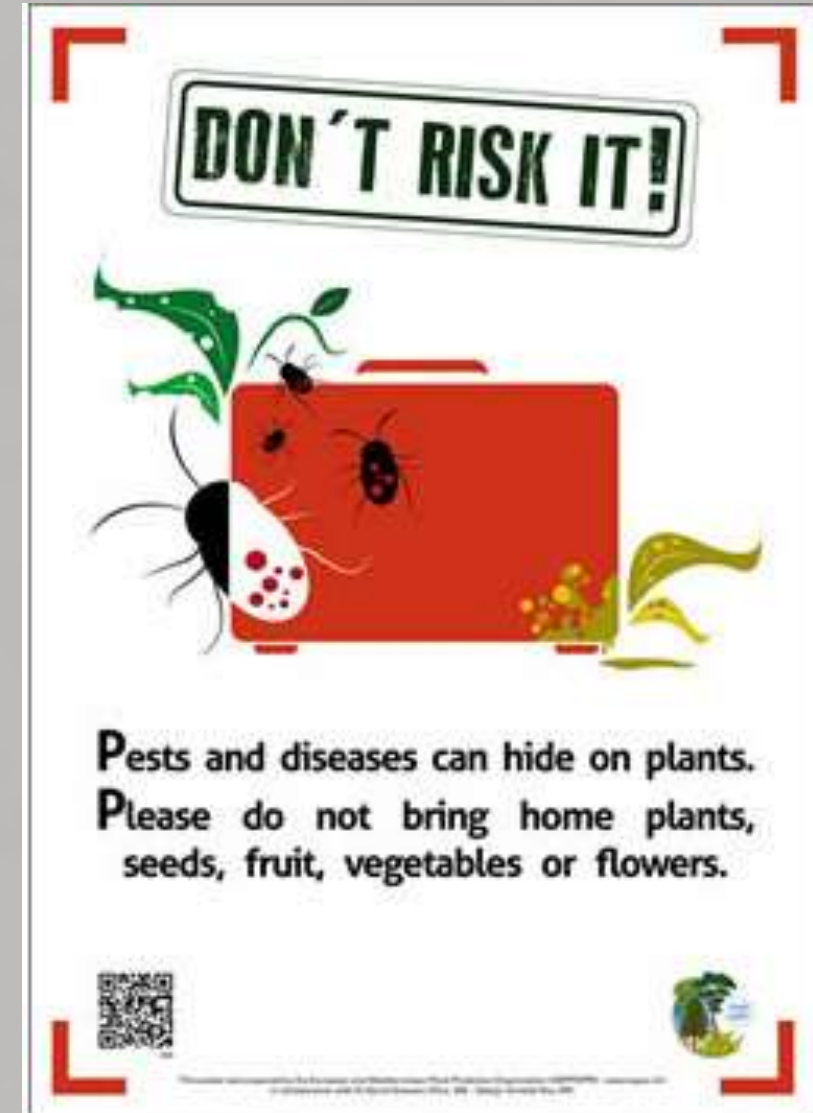


BIOSECURITY THREATS

Climate
change

Travel

Breeding



BIOSECURITY PLAN: RISK MITIGATION

Oil Palm Industry Biosecurity Plan

Protection from risks posed by pests through exclusion, eradication and control

Pre-Border

- Identifying exotic pest threats
- Import conditions and phytosanitary measures
- Managing quarantine risks offshore (pre-clearance inspection)
- Treatment at point of export where appropriate

Border

- Implementing effective quarantine for people, plants, machinery and goods
- Efficient border controls
- Establishing trapping & surveillance networks for pests that may bypass checkpoints

Post-Border

- Minimizing risk of regional or property entry & establishment
- Preparing for timely detection, minimised spread and rapid response to emergency pests
- Continuous surveillance and monitoring
- Farm/estate biosecurity

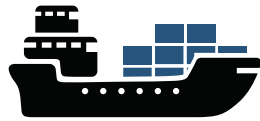
Achieved through effective partnerships between industry, government and the community

ENTRY POINTS IN PENINSULAR MALAYSIA & LABUAN

- 111 entry points throughout Peninsular Malaysia & Labuan



25



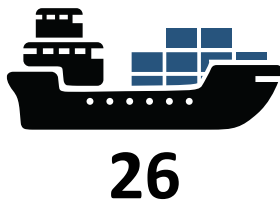
67



19



ENTRY POINTS IN SARAWAK & SABAH

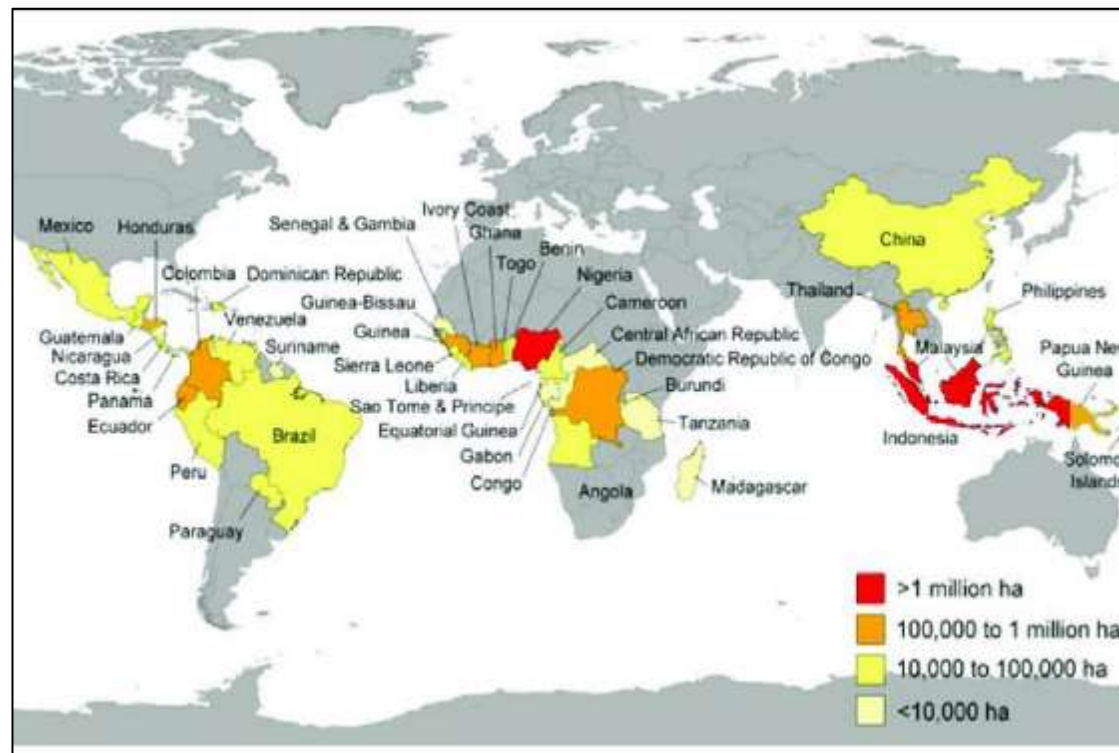


- 63 entry points throughout Sabah & Sarawak

OIL PALM INDUSTRY IN MALAYSIA

BIOSECURITY ISSUES & CHALLENGES

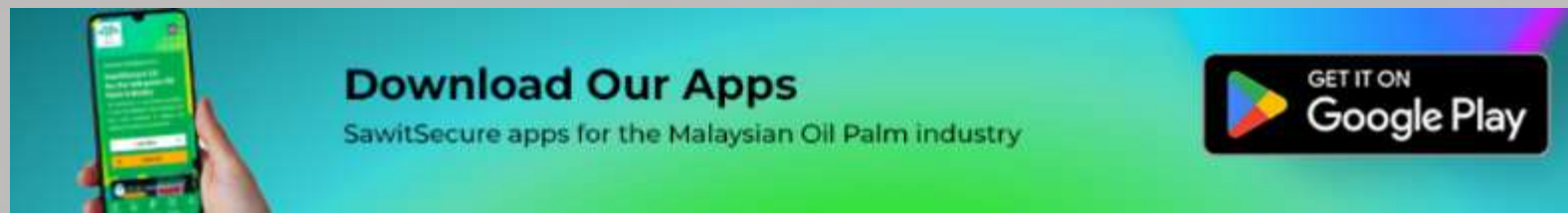
- Over 40 oil palm growing countries with over 600 pests and diseases recorded.
- Movement of planting materials and germplasm in response to growing demand.
- Many pests and diseases of oil palm are not yet recorded in Southeast Asia.



BIOSECURITY PLAN FOR THE MALAYSIAN OIL PALM INDUSTRY



Launched on 12 November 2018



BIOSECURITY PLAN FOR THE MALAYSIAN PALM OIL INDUSTRY

Pest Risk Assessments

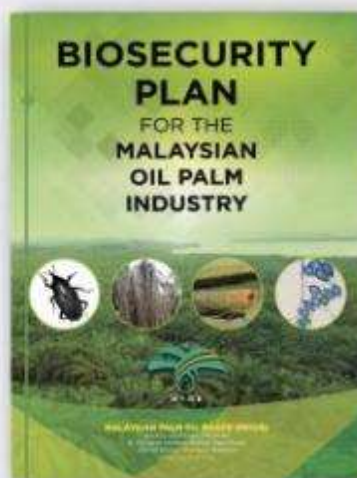
- 25 priority oil palm pests and diseases (17 pests and 8 diseases)
- 99 exotic weeds

Contingency Plan & Response Management

- Key Stages in an Emergency Response
- Pest-Specific Emergency Response Information
- Surveillance, Awareness and Training

Risk Mitigation

- Barrier Quarantine
- Plantation-level Biosecurity
- Surveillance, Awareness and Training



Biosecurity Plan for the Malaysian Oil Palm Industry

A comprehensive biosecurity risk management and emergency response plan for the Malaysian oil palm industry

Awareness Materials

- Plant Pest Threats-Related Documents
- Relevant Websites
- Factsheets
- Contacts for Further Information on Oil Palm Industry Biosecurity

Threat Identification and Risk Assessment

- Introduction to Threat Identification and Risk Assessment
- Malaysian Oil Palm Industry Plant Pest Threat Priority List

SawitSecure: THE OIL PALM BIOSECURITY MOBILE APPLICATION



Mohd Helmi Rusli, Idris Abu Seman, Maizatul Suriza Mohamed and Norman Kamarudin

TOS180

NOVELTY / HIGHLIGHTS

- Biosecurity Plan for the Malaysian Oil Palm Industry was launched in November 2016 (Figure 1).
- An oil palm biosecurity mobile application (SawitSecure) was developed and available on App Store and Google Play (Figures 2, 3, 4 and 5).
- Comprehensive resources on exotic pests, diseases and weed species in oil palm plantations are filtered out from 44 growing countries.
- As a quick reference for stakeholders to recognize the exotic pests, diseases and weed species.
- Informative fact sheets on dangerous exotic pests (17), diseases (8) and weed species (98) associated with oil palm, which are not reported in Malaysia.



Figure 1: The Biosecurity Plan book cover

Figure 2: SawitSecure homepage

Figure 3: Pest Risk Assessment interface

Figure 4: Contact Us form

Figure 5: SawitSecure is available on App Store and Google Play

BENEFITS / ADVANTAGES

- An ideal tool kit for biosecurity risk management for the Malaysian oil palm industry.
- Emergency report – stakeholders can easily attached pictures and send report to MPOB or DOA, to confirm pests and diseases in the plantation or port of entry.
- Provide direction and guidance to all relevant sectors especially in quarantine services.

THE CLIENTS

- Government agencies, e.g. Department of Agriculture (DOA), Malaysian Quarantine and Inspection Services (MAQIS), Oil palm industry and smallholdings.
- Research institutes, quarantine laboratories and universities.

COST

- FREE for download from App Store and Google Play.
- Biosecurity Plan for the Malaysian Oil Palm Industry book. Available at <http://palmshoppe.mpob.gov.my> (RM50.00/unit).

BIOSECURITY PLAN

FOR THE MALAYSIAN OIL PALM INDUSTRY



MALAYSIAN PALM OIL BOARD

5, Persiaran Institusi, Bandar Baru Bangi
43000 Kajang, Selangor
www.mpob.gov.my

HIGHLY IMPORTANT EXOTIC PESTS & DISEASES OF OIL PALM

The Biosecurity Plan for the oil palm industry listed **25 highly important pests and diseases** screened from 120 pests and diseases of oil palm not yet present in Malaysia, reported in 44 oil palm producing countries based on Pest Risk Assessment (PRA).

RISK	DISEASE	PEST
Extreme	3	0
High	0	4
High-medium	2	4
Medium	1	0
Medium-low	1	6
Low	1	3
Total	8	17

Extreme Risk

Cadang-cadang

Coconut cadang-cadang viroid (CCCVd)

Distribution: Philippines, Solomon Islands

Bud rot

Phytophthora palmivora

Distribution: Latin America

Vascular wilt

Fusarium oxysporum f.sp. *Elaeidis*

Distribution: Africa

High-Medium Risk

Medium Risk

Marchitez letal / Lethal Wilt of oil palm

Candidatus phytoplasma asteris

Distribution: Africa, Latin America

Lethal yellowing, lethal yellowing-type disease

Candidatus phytoplasma palmae

Distribution: Africa, Latin America

Red ring disease nematode

Rhadinaphelenchus cocophilus
(= *Bursaphelenchus cocophilus*)

Distribution: Latin America

Cercospora leaf spot, Freckle of oil palm

Cercospora elaeidis

Distribution: Africa (Central, East and West regions); Australia (Northern Territory – recorded on *Carpentaria acuminata*); Suriname; Thailand

Medium-low Risk

Low Risk

Marchitez sorpresiva, Sudden wilt

Phytoplasma staheli

Distribution: Caribbean, Central and South America

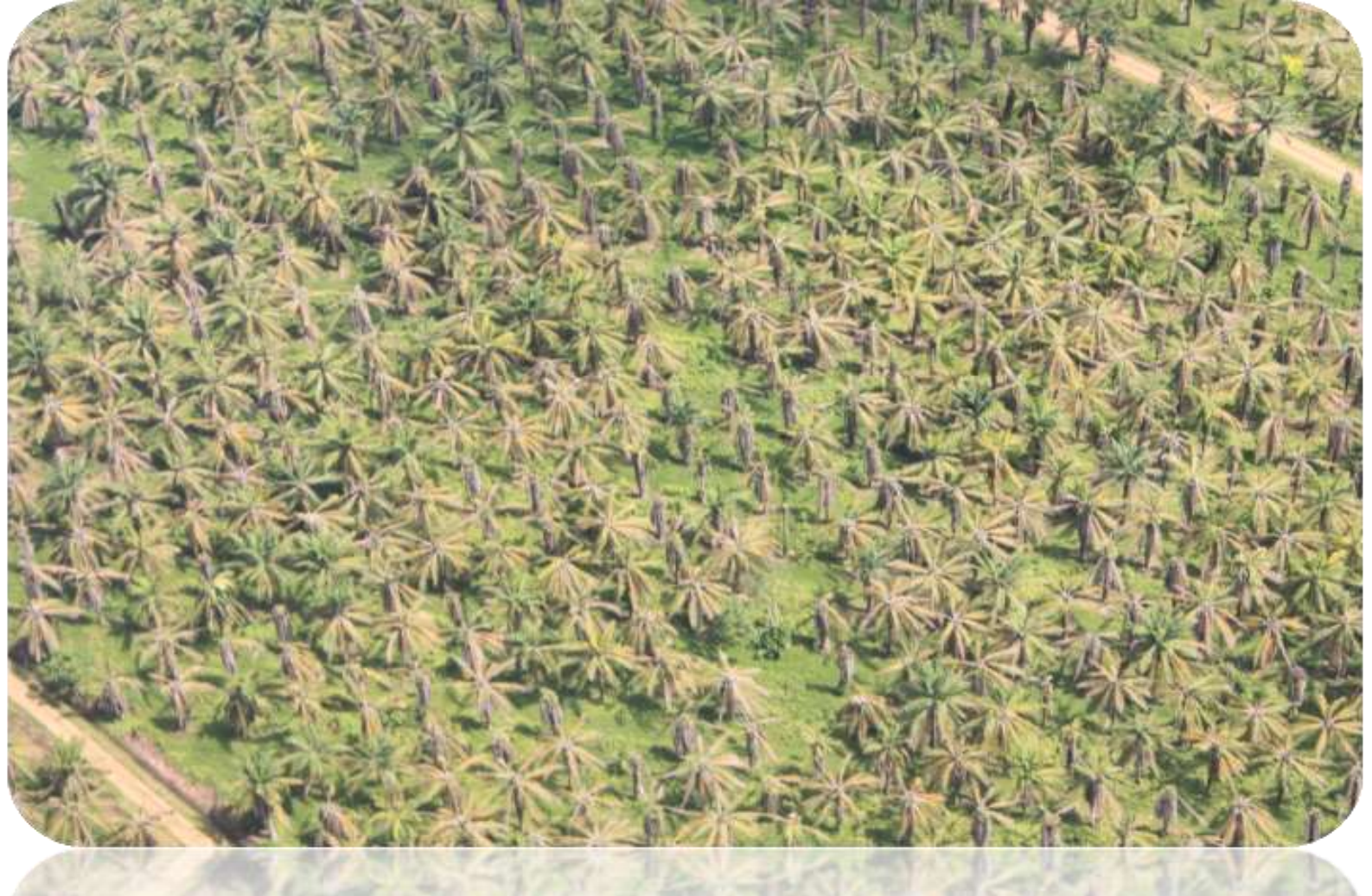
Chlorotic ring disease

Potyvirus SCMV strain

Distribution: South America, India

Extreme Risk: Bud Rot

- Severe outbreaks in Colombia, Brazil, Ecuador, Panama and Surinam.
- Affecting oil palm industry in Latin America for > 40 years
- In Tumaco, Colombia, > 30,000 ha out of 35,000 ha (85%) of oil palm were destroyed between 2006 and 2009 (Martínez et al., 2009)



Symptoms

Lesions on the spear leaf



Browning of whole spear



Stunted leaves (non-lethal form/*bud rot little leaf*)



Internal damage (advance stage)



Spear leaf production stops (lethal form)



- Infection affects the leaf primordia and apical meristem.
- When apical meristem is destroyed, the palm will not produce leaves and fruits, and eventually die

Cause of the disease?

Phytophthora palmivora

Kingdom: Chromista

Superphylum: Heterokonta

Phylum: Oomycota/Pseudofungi

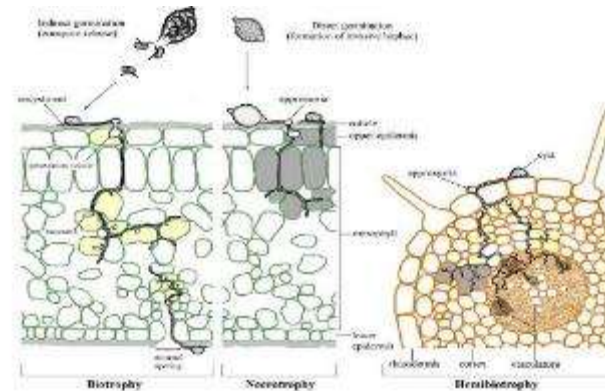
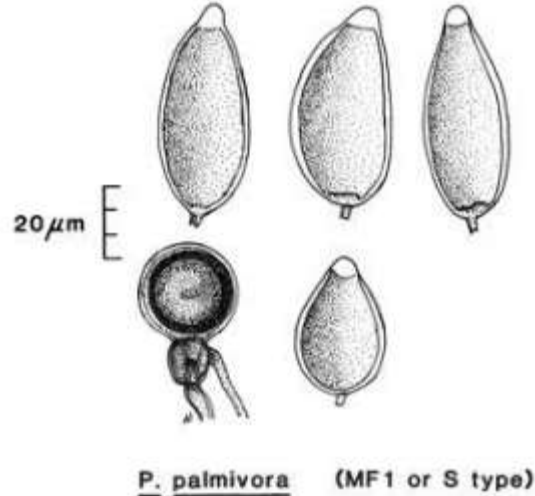
Class: Oomycetes

Order: Pythiales

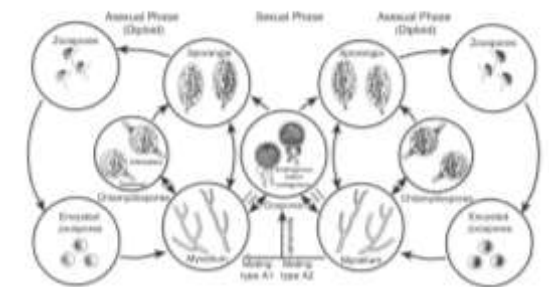
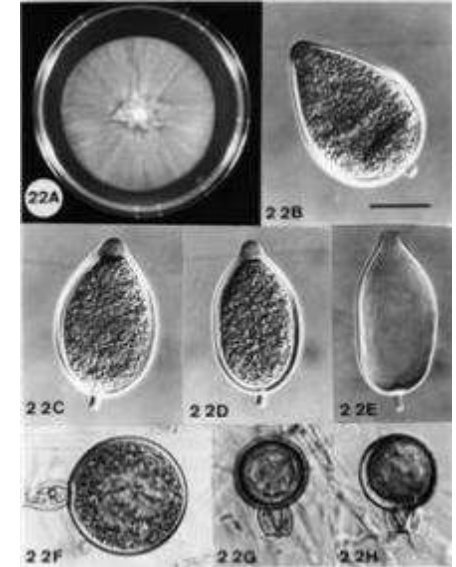
Family: Pythiaceae

Genus: Phytophthora

Species: Palmivora



Colonization by oomycetes (Fawke et al., 2015)

Phytophthora life cycle
(Ribeiro (2013))

Bud Rot Disease Coconut

Reported in Malaysia, Indonesia, Sri Lanka, The Philippines

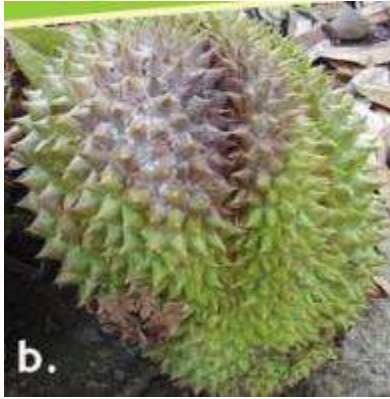


Coconut plantation with bud rot diseased palm (centre)(adapted from (Smith and Flood, 2001)



Coconut bud rot symptoms: cross section of meristem (left) and spear droop (right)

Phytophthora palmivora diseases in Malaysia/South East Asia (SEA)



Black pod/fruit rot – cocoa, durian, jackfruit



Fruit blight of papaya



Stem canker – durian, cocoa, jackfruit



Leaf diseases –
rubber, cocoa
(seedlings)

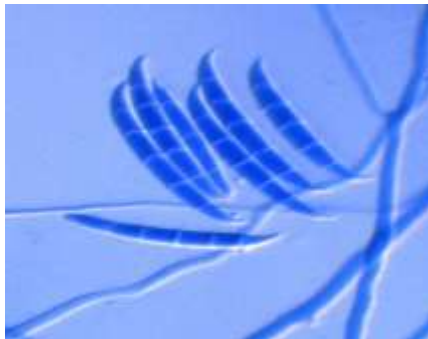
Extreme Risk: Vascular Vilt

Causal: Fungi

Fusarium oxysporum f.sp.
Elaeidis

Distribution

Africa



Vascular discoloration at the base of seedling



Leaf symptoms on mature palm



Extreme Risk: Coconut Cadang-cadang

Causal: *Viroid*

*Coconut cadang-cadang
viroid (CCCVd)*

Distribution

Philippines, Solomon Islands



Leaflets from healthy coconut palm (left) and severely infected palm (right) showing yellow spotting



High-Medium Risk

Marchitez letal / Lethal Wilt

Causal: *Phytoplasma*

Candidatus phytoplasma asteris

Region: Africa & South America



Lethal yellowing, lethal yellowing-type disease

Causal: *Phytoplasma*

Candidatus phytoplasma palmae

Region: Africa & South America



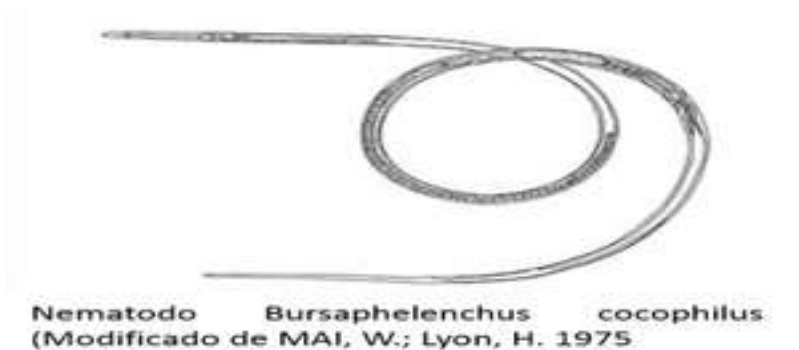
Red ring

Causal:

Nematode

Rhadinaphelenchus cocophilus (= *Bursaphelenchus cocophilus*)

Region: South America & Mexico



Chlorosis and wilting due to *Rhadinaphelenchus cocophilus*

Medium Risk

Cercospora leaf spot

Causal: Fungi

Cercospora elaeidis

Region: Africa, Suriname & Thailand



Medium-Low Risk

Marchitez sorpresiva, Sudden wilt

Causal:

Phytophthora staheli

Region: South America



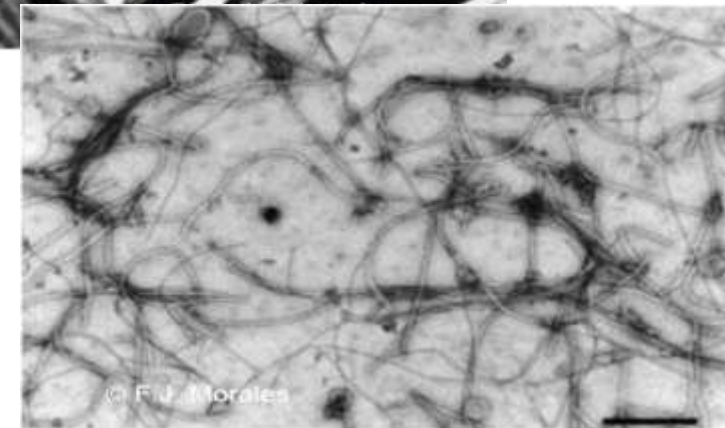
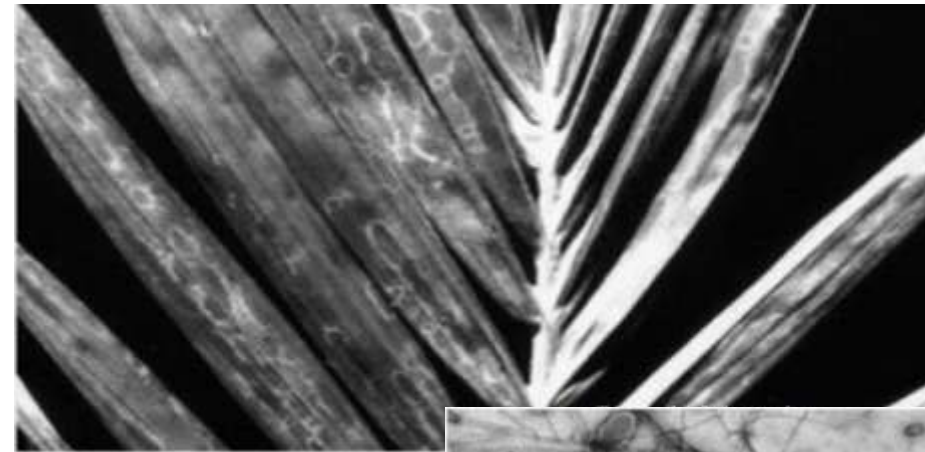
Low Risk

Chlorotic ring disease

Causal: Virus

Potyvirus SCMV strain

Region: South America, India



DISEASE DIAGNOSTIC AS BIOSECURITY TOOL

- **Reduce risk of spread potential**

Stop contaminated materials movement for example at the entry points such as ports and borders.

- **Disease control management**

Effective an early stage of the disease development



TT No. 627
Disease: Bud rot
Target Pathogen: *Phytophthora* spp.
Method: Isothermal amplification (LAMP)
Contact person: Dr. Maizatul Suriza Mohamed (suriza@mpob.gov.my)



TT No. 533 & 629
Disease: Fusarium wilt
Target Pathogen: *Fusarium* spp, *Fusarium oxysporum*, *Fusarium oxysporum* f.sp. *Elaeidis*
Method: Polymerase chain reaction (PCR)
Contact person: Dr. Mohd Hefni Rusli (hefni@mpob.gov.my)



TT No. 609 & 628
Disease: Orange spotting
Target Pathogen: Coconut cadang-cadang viroid
Method: Hydrolysis probe & isothermal amplification (LAMP)
Contact person: Dr. Madihah Ahmad Zairun (Madihah@mpob.gov.my) & Dr Nur Diyana Roslan (diyana@mpob.gov.my)

Diagnostic Kits



TT No. 188
Disease: Basal stem rot
Target Pathogen: Pathogenic *Ganoderma*
Method: Polymerase chain reaction (PCR)
Contact Person: Nur Hailini Zainol Hilmi (hailini@mpob.gov.my)



TT No. 670
Disease: Bunch rot
Target Pathogen: *Marasmius palmivorus*
Method: Polymerase chain reaction (PCR)
Contact person: Dr. Maizatul Suriza Mohamed (suriza@mpob.gov.my)

TOP 3 HIGH RISK WEEDS

1



Ageratina adenophora

2



Ranunculus sceleratus L

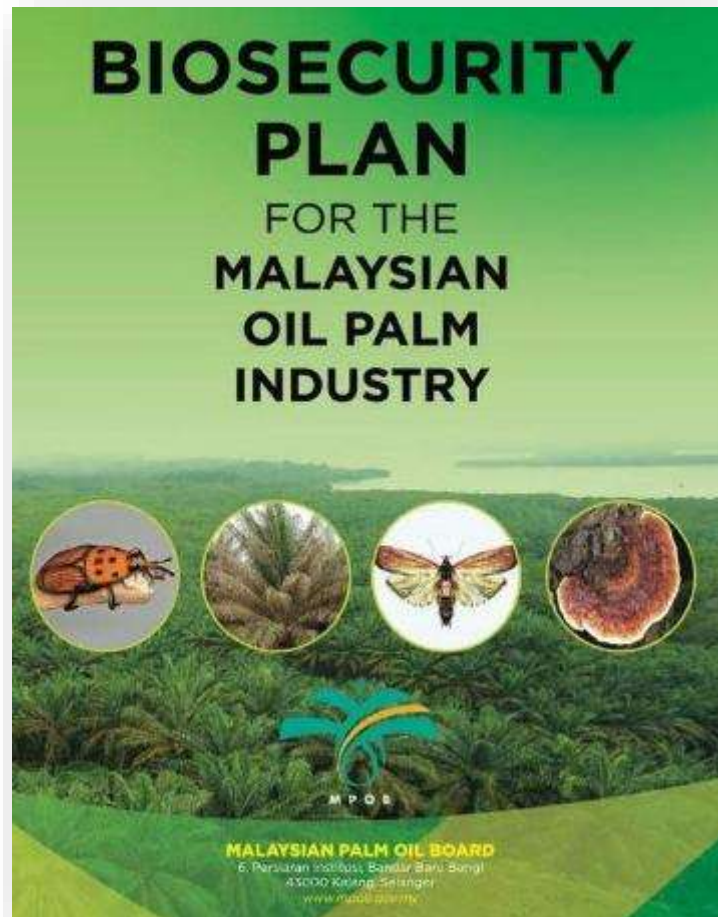
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Alternanthera philoxeroides

[listed as a serious weed in the Malaysian Plant Quarantine Regulations 1981]

UPDATING OP BIOSECURITY PLAN



- The current biosecurity plan is being updated with new information on regulations, procedures, and relevant agencies.
- Include revision of factsheets for 25 priority oil palm pests and diseases, along with their risk assessments.
- The updating process involves four main workshops.

Workshop Series (MPOB)

Workshop 1	OP Biosecurity Plan Framework (MPOB & DOA) 12-14 November 2024
Workshop 2	Threat Identification (Factsheet) & Pest Risk Assessments May 2026
Workshop 3	Risk Mitigation & overall document preparation October 2026
Workshop 4	Review of final draft with stakeholders December 2026



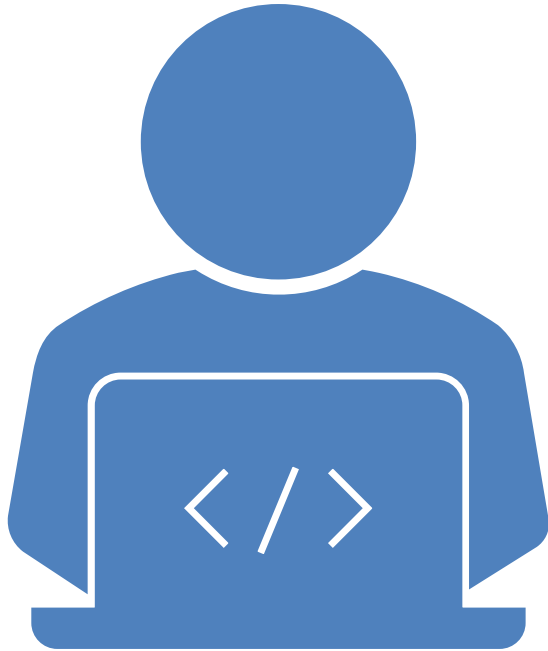
The first workshop, held in November 2024, was attended by experts from MPOB and the Department of Agriculture and focused on discussions on the framework and structure of the new biosecurity plan



CONCLUSION

- The Biosecurity Plan is essential to stop the entry and spread of exotic pests, diseases, and weeds that could severely impact the oil palm industry.
- Effective biosecurity requires strong cooperation among government agencies, industry players, and stakeholders to ensure Malaysia remains free from devastating biological threats.
- For existing pests, diseases, and weeds, the industry and smallholders need to actively implementing preventive and curative measures to safeguard productivity and sustainability.





Thank you

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MALAYSIAN PALM OIL BOARD

Lembaga Minyak Sawit Malaysia

Kementerian Perlindungan dan Komoditi