



Food and Agriculture
Organization of the
United Nations



International
Plant Protection
Convention

Plant Health Surveillance Systems

A vital part of NPPO phytosanitary and biosecurity systems to prevent, prepare, respond and manage the introduction and spread of plant pests and diseases.

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What is Plant Health Surveillance

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ISPM 5 Glossary of Phytosanitary Terms;

- **Surveillance** - An **official** process which collects and records data on **pest** presence or absence by **survey, monitoring** or other procedures [CEPM, 1996; revised CPM, 2015]



National Surveillance Requirements

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- Surveillance is one of the core activities of national plant protection organizations (NPPOs)
- It provides NPPOs with a technical basis for many phytosanitary measures;
 - Determining national and regional **phytosanitary and biosecurity risks**
 - Supporting claims of **pest absence**
 - Developing **pest lists** to justify phytosanitary measures and inform **pest risk analyses**
 - Informing **eradication and control measures**
 - Meeting **International reporting** requirements (ISPM 17 pest reporting)

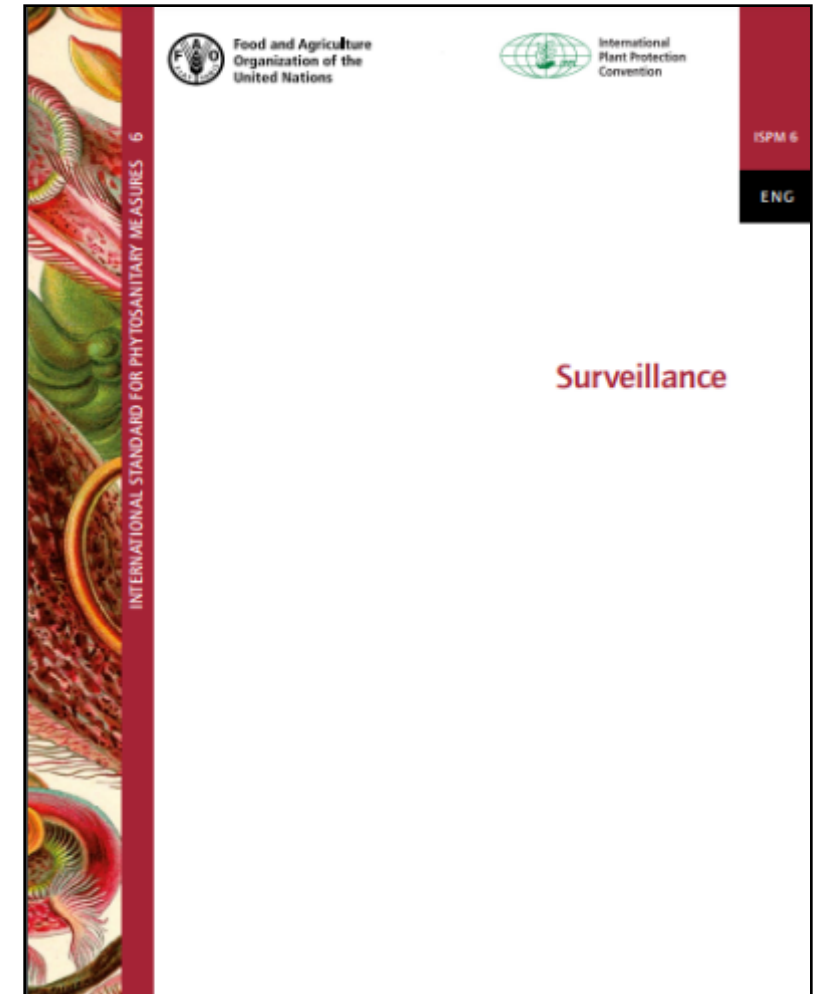




Surveillance Standard ISPM 6 (Surveillance)

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- ISPM 6 describes the requirements for surveillance and the specific requirements and components of a national surveillance system
- ISPM 6 was adopted by the CPM-13 (**2018**) and replaced the original ISPM 6 (Guidelines for surveillance) that was adopted in 1997
- The first guide on Plant Pest Surveillance was developed and published in **2016**

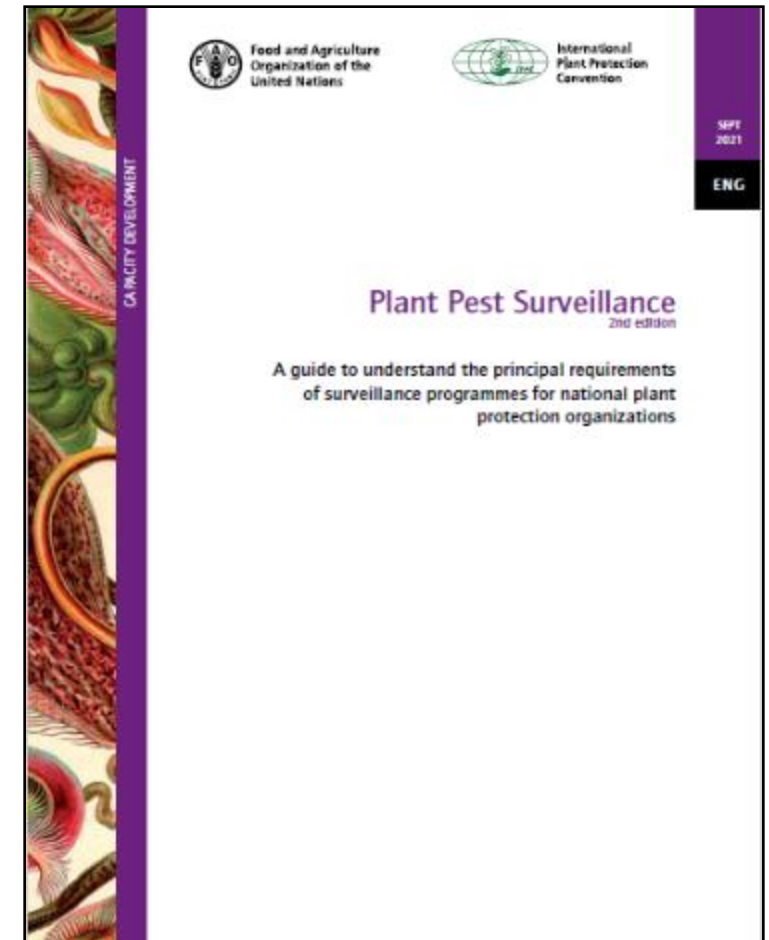




Surveillance Guide (2nd edition)

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- The Surveillance Guide was developed to assist NPPOs with implementation of ISPM 6: *Surveillance*.
- The Surveillance Guide can also be used to assist NPPO's in establishing the fundamental components of a 'National Surveillance System'.
- <https://www.fao.org/documents/card/en/c/cb7139en>





IPPC Surveillance Standard and Plant Pest Surveillance Guide

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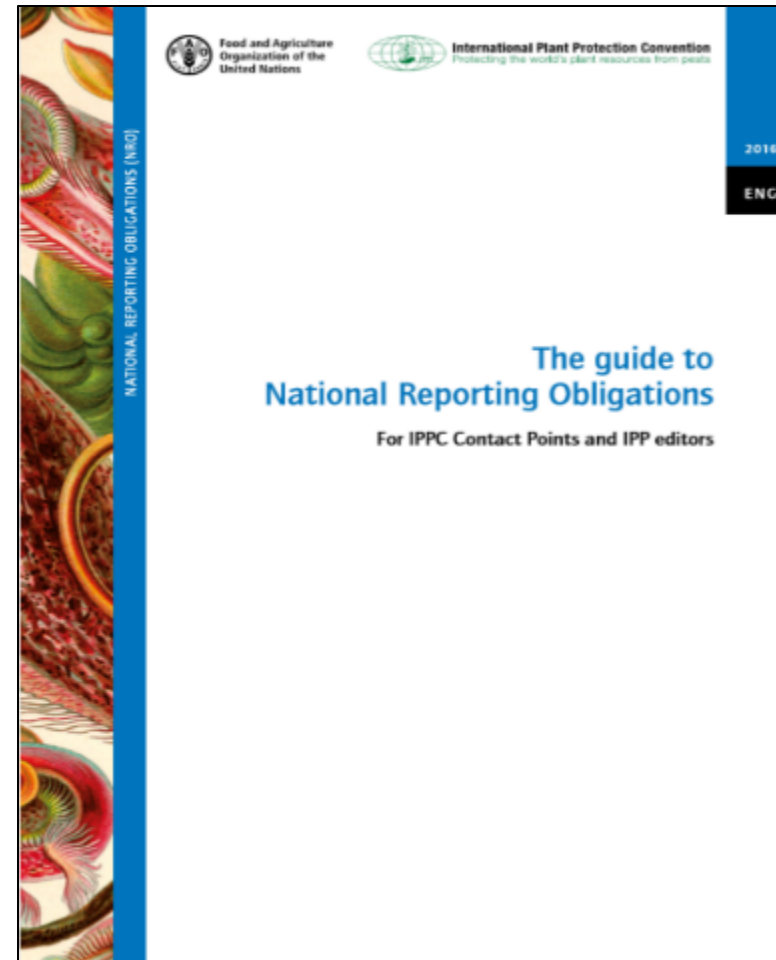


IPPC Reporting Standard and National Reporting Obligations Guide

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<https://www.fao.org/3/y4224e/y4224e.pdf>




<https://www.fao.org/documents/card/en/c/ca6377en>

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<https://www.fao.org/documents/card/en/c/ca6377en>

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Countries / Pest Reports Bulletin / 								
<h2>Pest Reports Bulletin</h2> <p>The Pest Reports Bulletins are monthly summaries on Pest Reports submitted by countries. Click on the links below to open the bulletin on new or updated Pest Reports submitted by countries in that month.</p> <p>← Go back</p>								
2020	January May	February June	March July	April				
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2018	January May September	February June October	March July November	April August December				
2017	January May September	February June October	March July November	April August December				
2016	January May September	February June October	March July November	April August December				
2015	January May September	February June October	March July November	April August December				
2014	January May September	February June October	March July November	April August December				
2013	January May September	February June October	March July November	April August December				



Reporting TR4 Detections and Range Extensions

IPPC Fusarium TR4 Surveillance Webinar

Panama disease tropical race 4, *Fusarium oxysporum* f. sp. cubense tropical race 4

[« Back to Pest Reports](#)

Publication Date Wed, 12 Jul 2017, 07:23

Last Updated July 12, 2017, 7:23 a.m.

Report Number AUS-84/1

Country Australia

Report Status Final

Hosts The affected agricultural hosts are restricted to the family Musaceae. The following taxa are known to be susceptible: • Musaceae: *Musa* spp. (bananas), including *Musa acuminata*, *Musa balbisiana* and *Musa textilis*, as well as hybrid taxa. *Fusarium oxysporum* f. sp. cubense tropical race 4 has also been isolated from a range of weed and grass roots. These plants are asymptomatic and their role in the disease infection cycle of banana plants is unknown.

Pest Status (old values from ISPM 8 -1998) • Present: subject to official control

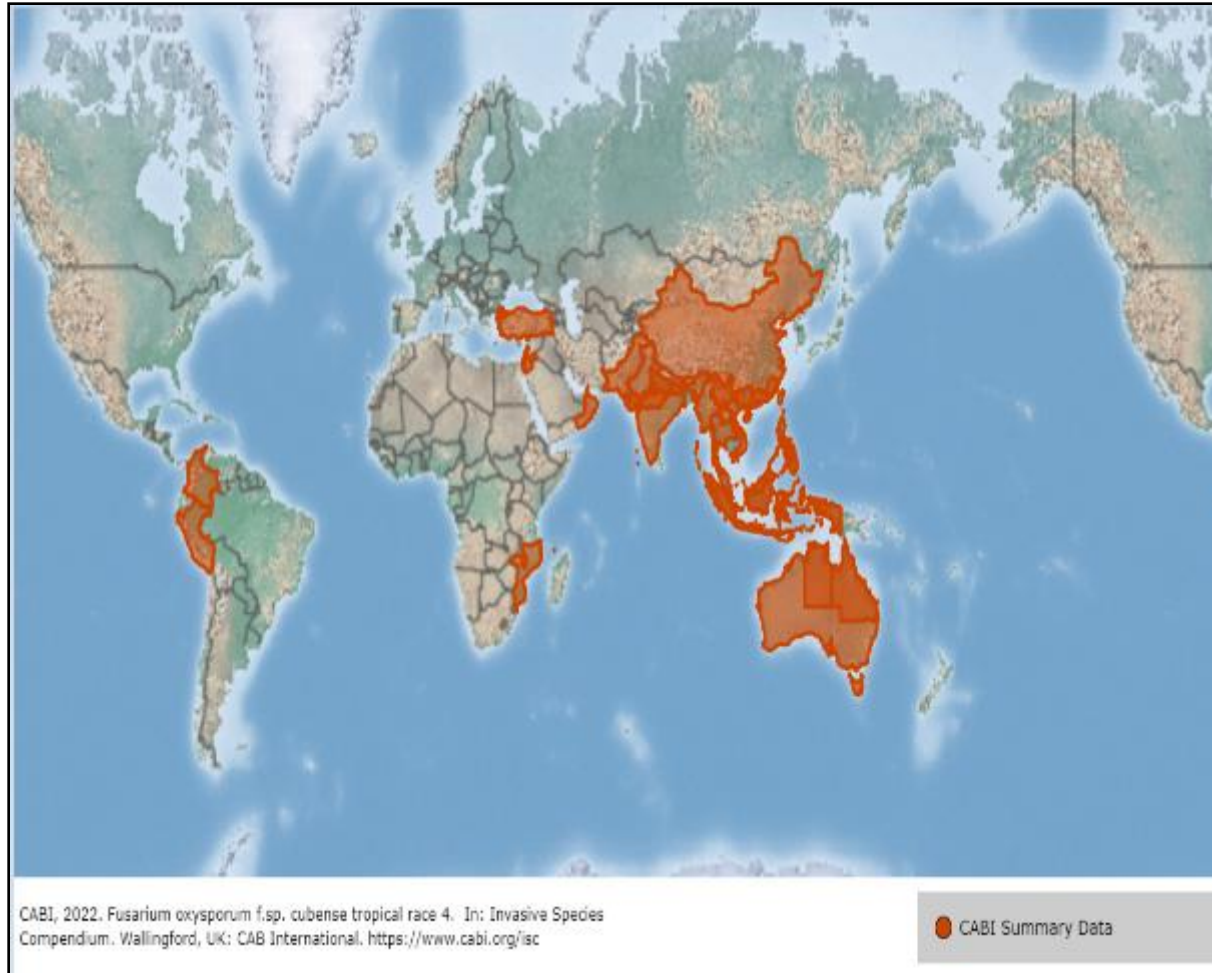
Pest Status (ISPM 8 - 2021) • Present: not widely distributed and under official control

Geographical Distribution *F. oxysporum* f. sp. cubense tropical race 4 was detected in the Northern Territory in 1997, restricted to properties at Berry Springs, Lambell's Lagoon, Middle Point and Humpty Doo. The pathogen was also detected in Queensland in 2015, and is restricted to a single property near Tully.

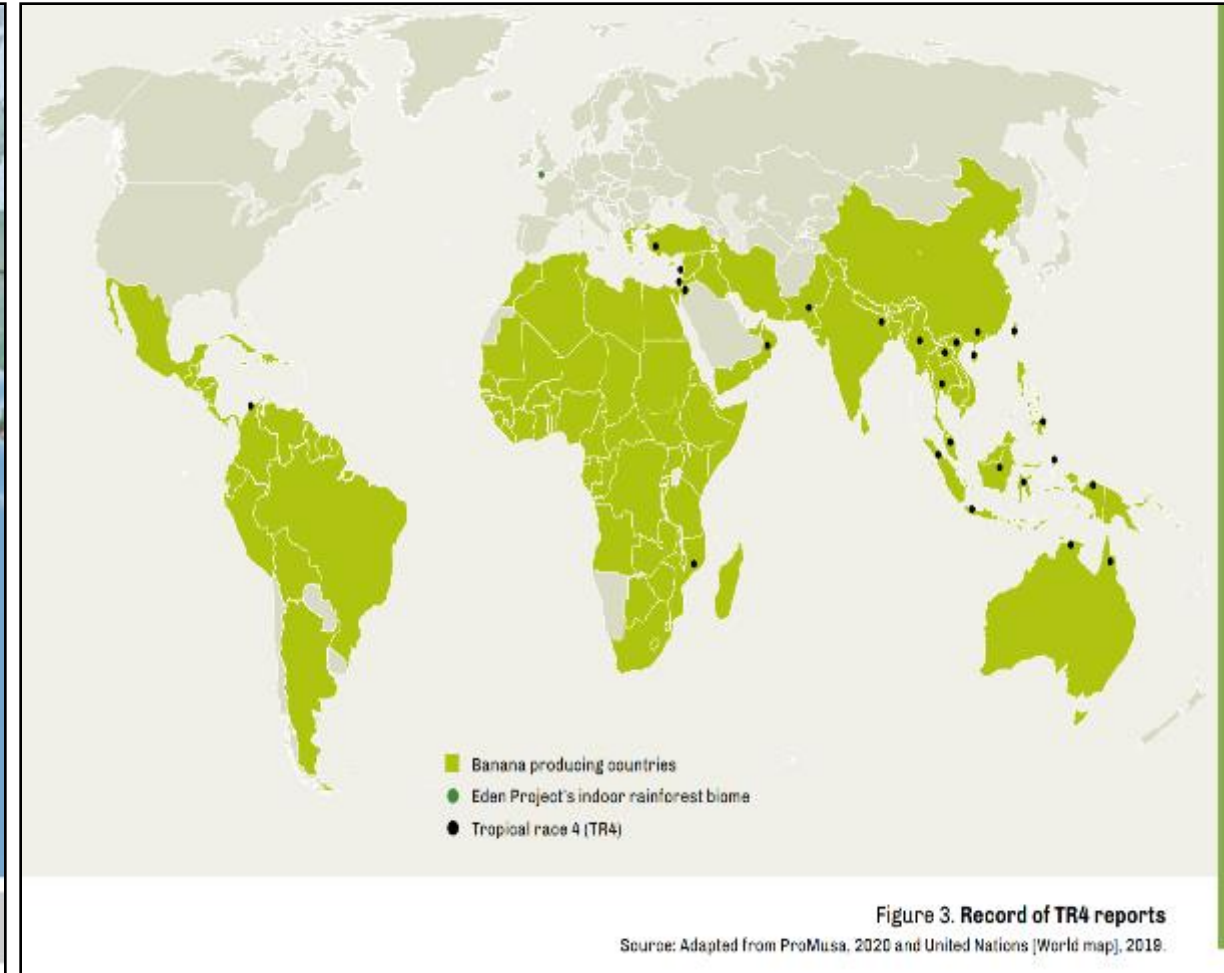
Summary *Fusarium oxysporum* f. sp. cubense blocks the vascular system of infected banana plants, causing them to wilt and die. Panama disease can spread between adjacent banana plants by root to root contact and by the movement of soil and water infected with fungal spores. Weevil borer insects are also known to carry the pathogen. Long distance spread of Panama disease occurs through the movement of infected planting material and soil, and can also be carried on contaminated tools, machinery, footwear and clothing.

Fusarium TR4 Pest Distribution (Official and Unofficial Reporting)

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Source Credit CABI - *Fusarium oxysporum* f.sp. cubense tropical race 4 (Foc TR4) ([cabi.org](https://www.cabi.org))



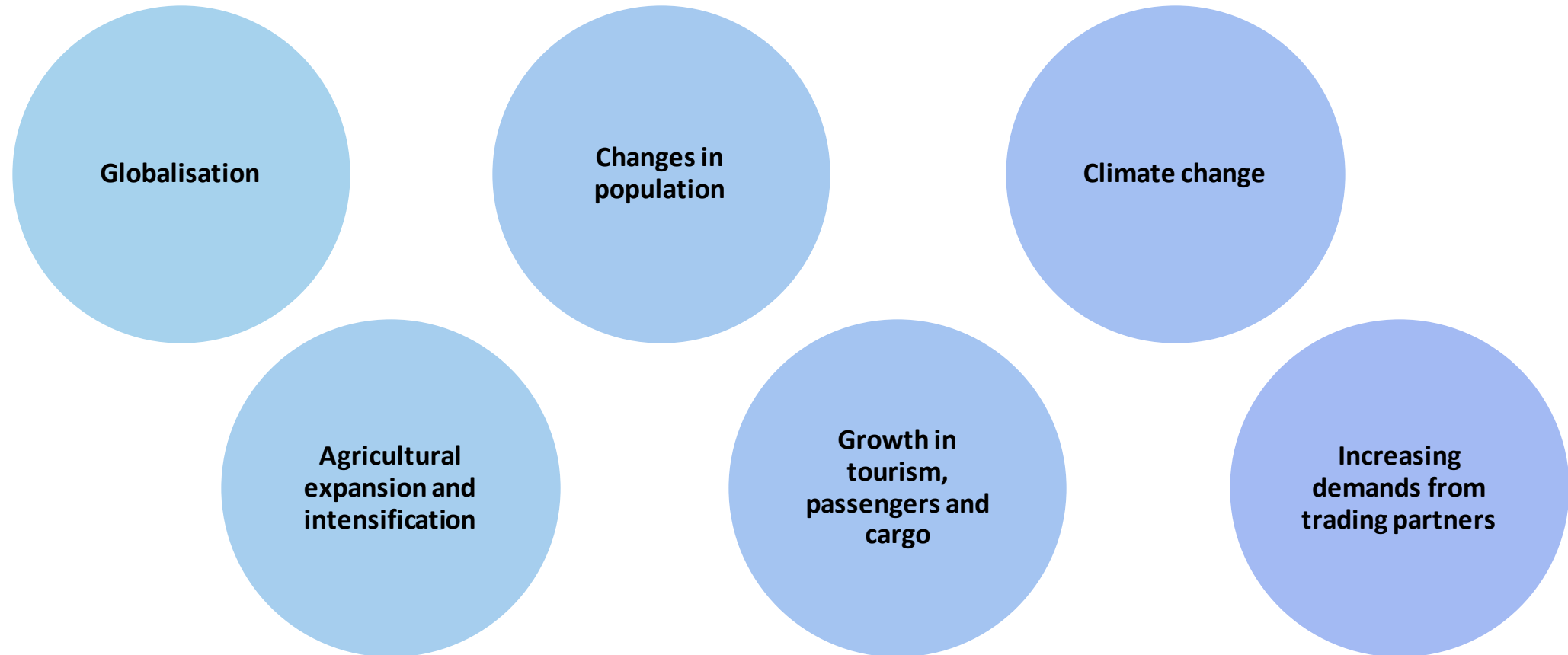
Source Credit - Preventing the spread and introduction of banana fusarium wilt disease
Tropical race 4 (TR4) ([fao.org](https://www.fao.org))



Why is Plant Health Surveillance Important?

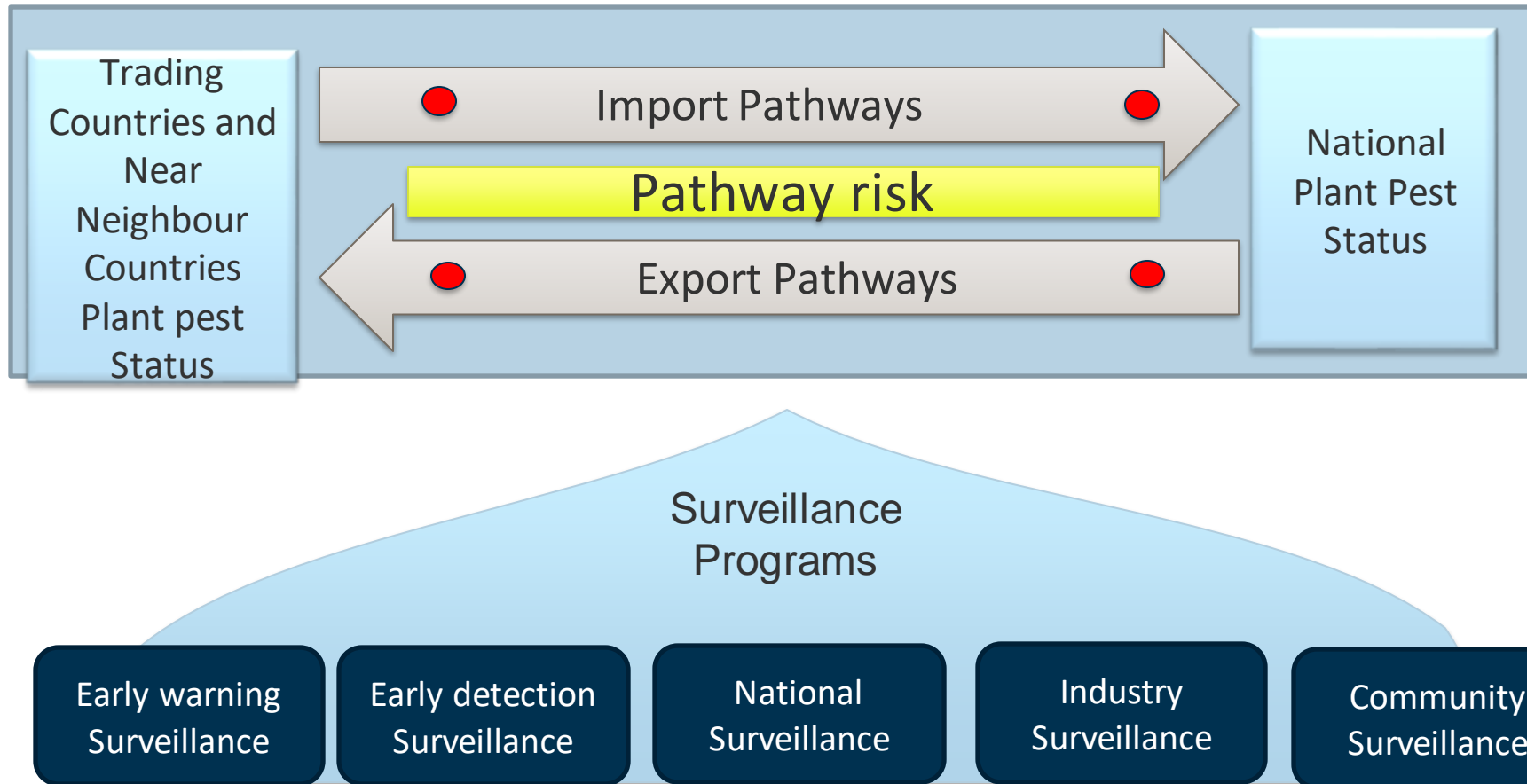
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Growing Phytosanitary Threats and Challenges Domestically, Regionally and Globally



NPPO phytosanitary and biosecurity risk management

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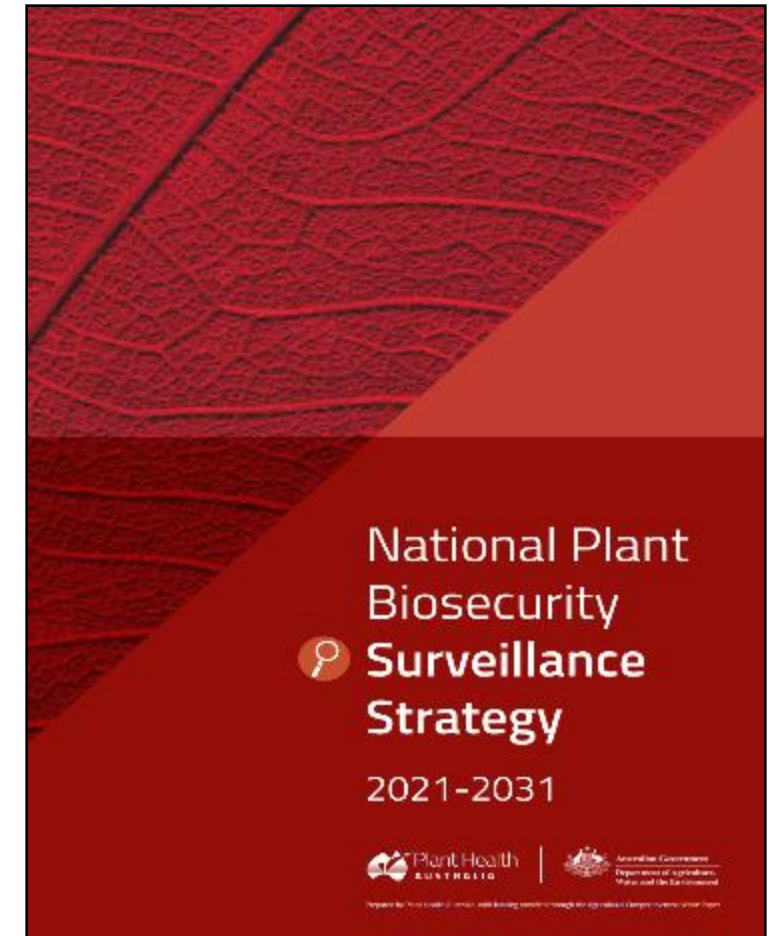




National Plant Pest Surveillance System

- A **national surveillance system** is an integral part of a country's plant health strategy and should contribute to the facilitation of trade.
- A **national surveillance system** should comprise surveillance programs and the infrastructure and governance to implement them;
 - **NPPO Programs** (Pre-border, Border, Post-Border)
 - **Pest Specific Programs** (fruit flies, Fusarium TR4, FAW)
 - **Commodity Specific Programs** (forestry, banana, citrus, grain)
 - **Trade and Market Access Specific Programs** (PFA, delimiting)

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Credit Source: Plant Health Australia: NPBS-Surveillance-Strategy.pdf (planthealthaustralia.com.au)

NATIONAL PLANT BIOSECURITY SURVEILLANCE SYSTEM FRAMEWORK

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Plant biosecurity is a set of activities and measures that protect the economy, environment and community from the negative impacts of plant pests by reducing the likelihood of a pest entering the country or region and as such, support an overall system that increases confidence that the pest will be reported, accurately diagnosed and controlled rapidly.¹

National plant biosecurity surveillance system objectives:

1. **Early warning** to detect plant pests at high-risk pathways
2. **Early detection** to reveal the presence of plant pests
3. **Pest status** to demonstrate absence/area freedom of plant pests to support market access
4. **Delimiting** to determine the physical extent of plant pests to inform emergency responses and management
5. **Monitoring** established pests for ongoing management arrangements

SURVEILLANCE ENABLERS

- Policy and legislation
- Partnerships and shared responsibility
- Resources and funding
- Processes and workflows
- Information management
- Technology and tools
- Risk analysis and risk based allocation
- People capability
- Communications and engagement
- Evaluation and assurance

SURVEILLANCE PROCESSES

SPECIFIC SURVEILLANCE

- Specific surveillance programs
- Design (surveys, trapping)
- Delivery
- Data collection
- Protocols and procedures
- Capability and capacity

GENERAL SURVEILLANCE

- Observations
- Inspections
- Notifications
- Investigations
- Data collection

DIAGNOSTICS

- Quality systems
- Proficiency testing programs
- Diagnostics protocols
- Pest reference system
- Capability and capacity

APPLICATIONS

PESTS

- Emerging pests
- Emergency plant pests
- Industry priority pests
- Social amenity pests
- Environmental pests

REGIONS

- Border
- Offshore
- Onshore
- Urban/peri-urban
- Rural
- Northern Australia
- External Territories
- Jurisdictions
- Natural Resource Management regions

PATHWAYS

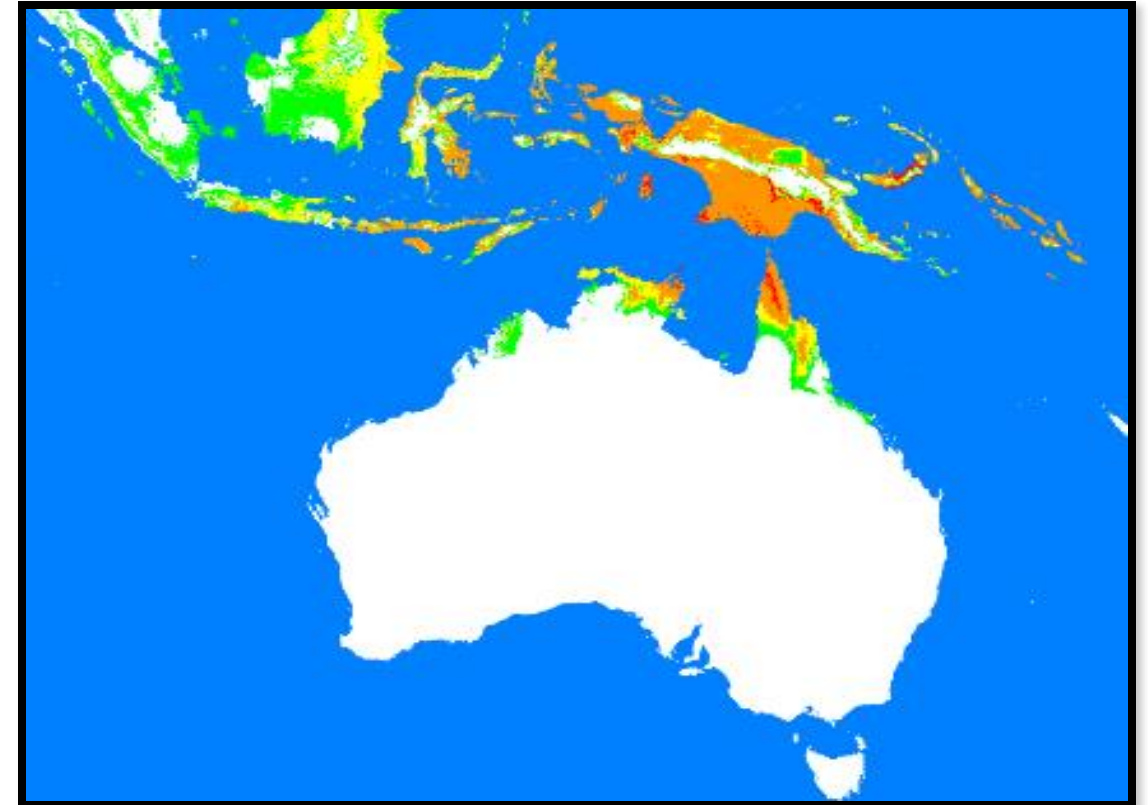
- Hosts
- Commodities and industries
- Regulated
- Unregulated/natural
- Emerging pathways

¹Source: National Plant Biosecurity Strategy (PHA 2010) and National Plant Biosecurity Surveillance Strategy 2013-2020 (PHA 2012) (endorsed by government, associate and industry members)

Pre-Border (Early Warning) Surveillance Programs

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- Identifies regional and international plant pest risks for both **regulated and non-regulated (natural) pathways**
- Can be delivered through specific and/or general surveillance programs
- Assists in the **early detection, preparedness** and management of exotic plant pests
- Relies on close working relationships, formal agreements and shared regional biosecurity goals between NPPO's



Fusarium TR4 Early Warning and Early Detection Surveillance

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When TR4 is absent from a country, NPPO early warning and early detection actions should include;

- Organising training courses for NPPO staff, particularly on surveillance activities and phytosanitary measures, to ensure proficiency in implementing the plans.
- Conducting **general surveillance** through public education and awareness-raising initiatives addressed to stakeholders, particularly commercial banana producers.
- Conducting **specific surveillance** by detection surveys for TR4, based on visual examination.

Panama disease tropical race 4

Surveillance for 2021-22
Version 1.2 July 2021

Surveillance is the best way to find Panama disease tropical race 4 (Panama TR4). Early detection helps contain the disease and protect the banana industry from wider spread. The banana industry is important to Queensland, which is why the Queensland Government invests in a surveillance program. To ensure the Panama TR4 Program has the best chance of finding and controlling the disease early, the surveillance program is regularly reviewed.

1. Panama TR4 surveillance schedule for July 2021 to June 2022

Surveillance frequency on commercial banana properties is determined by the Panama TR4 Program, in consultation with the banana industry.

Since 2015, surveillance has been based on the number of links a banana property has to another banana property known to have the disease. In August 2020, surveillance was reviewed, and it was decided that all commercial banana properties will receive surveillance based on whether they:

- have had Panama TR4 detected
- are in the Tully Valley
- are situated between Rollingsstone to Lakeland

From this time, the surveillance schedule will be:

IP and location	Surveillance
Panama TR4 infected property	Every eight weeks
Tully Valley	Every three months
All other commercial banana properties from Rollingsstone to Lakeland	Once in 12 months

2. Why did the Program change who gets surveillance and how often?

- By shielding all commercial banana properties from Rollingsstone to Lakeland we can confirm if the disease is contained to the Tully Valley.
- To make sure there is a cost effective surveillance program that protects your property and the banana industry from Panama TR4.
- Surveillance in the Tully Valley will detect any localised spread of the disease and contain it early.
- The disease has not been detected on banana properties with strong and medium links as expected.

3. Is there any risk to undertaking surveillance on infected properties every eight weeks?

Eight weeks is considered enough time to detect the disease early and allow for quick destruction of infected plants.

4. Why is surveillance necessary?

Surveillance will help detect the disease early. This means less buildup of fungal spores which reduces the ability for the spores to spread to the broader banana industry. If we don't visit all banana properties, we have less confidence that the disease is only in the Tully Valley.

For more information visit biosecurity.qld.gov.au or call 13 25 23

The Panama TR4 Program is a joint initiative between the Queensland Government and the Australian Quarantine and Inspection Service (AQIS).

Source Credit – Qld Government: [managing-panama-tr4early-detection-critical.pdf](https://publications.qld.gov.au/tr4early-detection-critical.pdf) (publications.qld.gov.au)

IPPC Draft Pest Outbreak Alert and Response System (POARS)

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Over arching components

Policy model

Legal framework

Financial model

Data management
and communication
system

Oversight

Pre-presence to detection

Alert

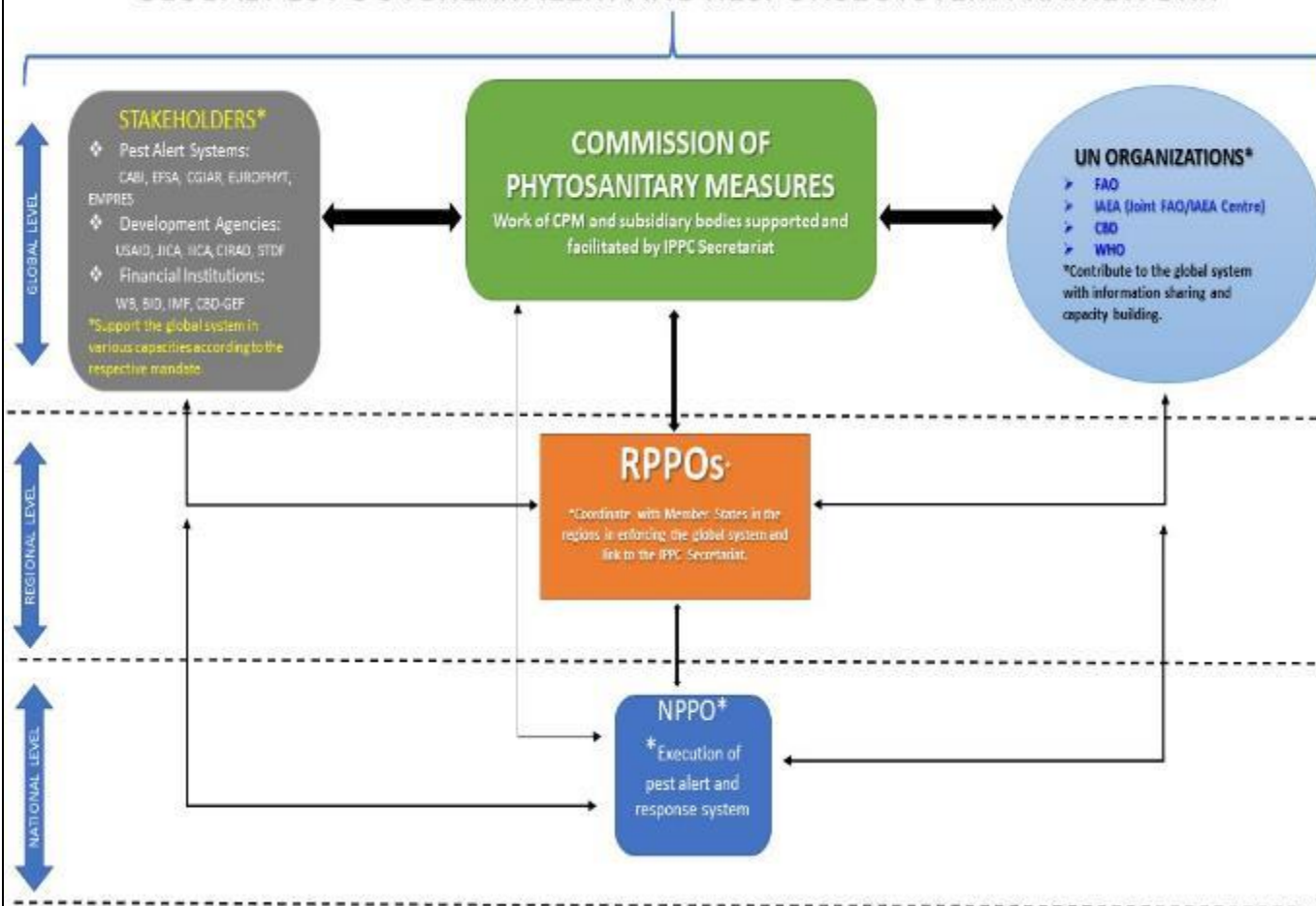
Early Detection

Post detection

Response

Notification

GLOBAL PEST OUTBREAK ALERT AND RESPONSE SYSTEM FRAMEWORK



Border (Early Detection) Surveillance Programs

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- Provides robust **biosecurity surveillance** extending beyond the border (including isolated and remote areas of the country)
- Monitors **international port areas and post entry quarantine locations** in partnership with industry and the community to detect exotic plant pests
- Enhances responsiveness to traditional quarantine controls (targeted surveillance)
- Conducts surveillance in **remote and isolated areas** to monitor for natural pathway incursions of exotic pests
- Includes **targeted trapping and general surveillance activities**



Post-Border (Early Detection and Delimiting) Surveillance Programs

- **Post-border surveillance** programs for exotic and endemic plant pests are carried out by governments, industries and the wider community.
- **Early detection surveillance** programs detect new pest incursions before they become widely established, increasing the chance of successful eradication or containment responses
- **Market access surveillance programs** provide surveillance records to demonstrate and validate the absence (i.e. evidence of absence) of a pest from the country, state or region, to support access to international and domestic markets
- **Delimiting surveys** provide information on the distribution and spread of pests for use in response management activities or to confirm the successful eradication of the pest

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Panama disease tropical race 4, Fusarium wilt *Fusarium oxysporum* f.sp. *cubense*

Where is it now?
Widespread including southern and south-east Asia including Indonesia. Detections have also occurred in Australia in the Northern Territory and in the Tully Valley in north Queensland.

How does it travel?
Plant material, soil, water, insect vectors







Where will I see it?
Whole plant



What will I see?
Marginal yellowing of leaves, and a skirt of dead leaves around plant. Discolouration of the cut stem and crown.

When will I see it?
Throughout the life of the plant.



Alternate hosts in Australia
A range of broadleaf weeds, grasses.

What could it be confused with?
In the early stages it can be mistaken for nutritional problems or water stress. Also causes similar symptoms to moko or blood disease, neither of which are present in Australia. Therefore, any suspected symptoms should be reported.

What to do if you see it?
Panama disease has been found on a small number of farms in the Tully Valley in Queensland and parts of the Northern Territory. Due to the impact of this pathogen on the banana industry any new detections should be reported to the Exotic Plant Pest Hotline or your local department of agriculture.

Source Credit – Plant Health Australia: [Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf](https://www.planthealthaustralia.com.au/Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf)
([planthealthaustralia.com.au](https://www.planthealthaustralia.com.au))

Fusarium TR4 Delimiting and Monitoring Surveillance

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- Conducting **specific surveillance** by delimiting surveys for TR4, based on visual examination.
- Conducting **general surveillance** through public education and awareness-raising initiatives addressed to stakeholders, particularly commercial banana producers.

Panama disease tropical race 4

Surveillance for Panama TR4

Panama TR4 is one of the greatest threats to worldwide banana production. In some countries, it's had a devastating impact on industries and livelihoods. If the disease is not managed, it has the potential to do the same in Far North Queensland.

Why is surveillance important?
Panama disease tropical race 4 (Panama TR4) is a soil-borne fungal disease that kills banana plants. Early detection, rapid destruction, and on-farm restrictions are the only ways to control and contain the disease. This is why surveillance is a key priority of the Panama TR4 response.

Biosecurity Queensland's Surveillance Program
The Panama TR4 Program has been undertaking surveillance since the disease was first detected in the North Queensland in 2015.

Under the Biosecurity Act 2015, the Program is authorised by the Director General to:

- determine the presence, prevalence of Panama disease tropical race 4 within Queensland
- monitor compliance with the Act
- inspect and/or take action to remove plants for signs of disease
- collect samples, or samples from banana plants for examination
- take photos and document information where collecting data and samples
- conduct the property for the time required to undertake activities.

For more information visit biosecurity.qld.gov.au or call 13 25 23

DID YOU KNOW?

Whilst all attempts will be made to control you, Biosecurity officers may need to access your property without your approval or without you being there – they are authorised under the law to do this.

What to expect

The Program will call to arrange a mutually suitable time to conduct surveillance on your farm. They will find you out they are attending, what they will do, and ask a few questions (including about land access, if applicable) and any reasonable biosecurity measures that you would like to discuss. This will be formally noted in the Consent for Entry form.

On arrival the surveillance team leader will contact you to request permission to enter your farm. They will ask you why they are attending and what they will do. They will accept if you have any safe and reasonable biosecurity measures that you would like the team to discuss. This will be formally noted in the Consent for Entry form.

Consent for Entry form the team leader will ask you to sign the 'Consent for Entry' form. You will be given a copy for your records.

Looking for Panama TR4 The surveillance officers may walk down with you in the banana production area looking for banana plants with external signs that could indicate the presence of Panama TR4.

If signs are detected If a plant with external signs consistent with the Panama TR4 infestation, surveillance officers will flag the plant for further investigation, and notify you. If a plant will be cut down for internal signs of the disease, samples of the plant will be taken for laboratory testing for the presence of the Panama TR4 fungus. Growers are encouraged to, eg, destroy.

Your plant samples
At least two samples from your farm will be taken, sealed and securely packaged. They will be sent to a specialist laboratory in Brisbane with a full, secure chain of custody. Testing may take up to two weeks, and the Panama TR4 Program will notify you of the results. Read the [Distinguishing Panama TR4 fact sheet](http://biosecurity.qld.gov.au) on biosecurity.qld.gov.au for more information.

More information and support
Biosecurity Queensland's Panama TR4 Program is working closely with growers, industry and the community to slow the spread of the disease. We can provide a range of information on the disease, decontamination processes, surveillance and management of Panama TR4. Call 13 25 23 or email panamatr4@bfat.qld.gov.au

biosecurity.qld.gov.au [f](https://www.facebook.com/BiosecurityQld) [i](https://www.instagram.com/BiosecurityQld) [y](https://www.youtube.com/BiosecurityQld) [in](https://www.linkedin.com/BiosecurityQld) @BiosecurityQld

If you see any signs of disease
Contact Biosecurity Queensland on 13 25 23 immediately. As Panama disease tropical race 4 is a Category 1 restricted matter under the Biosecurity Act 2015, it is a legal requirement to report it within 24 hours. Do not cut or remove the plant as cutting will trigger the fungus to release spores. As well, it might make it hard to get a suitable sample for diagnostic testing.

Biosecurity best practice
Biosecurity Queensland's officers will fully inform and consult with best practice. The surveillance team will ensure appropriate cleaning and decontamination processes to ensure they do not spread any diseases. They will adhere to biosecurity uniform biosecurity measures.

Checking your own plants for Panama TR4
Growers are encouraged to inspect their own surveillance in addition to the surveillance by the Panama TR4 Program – it is vital to us if you can help.

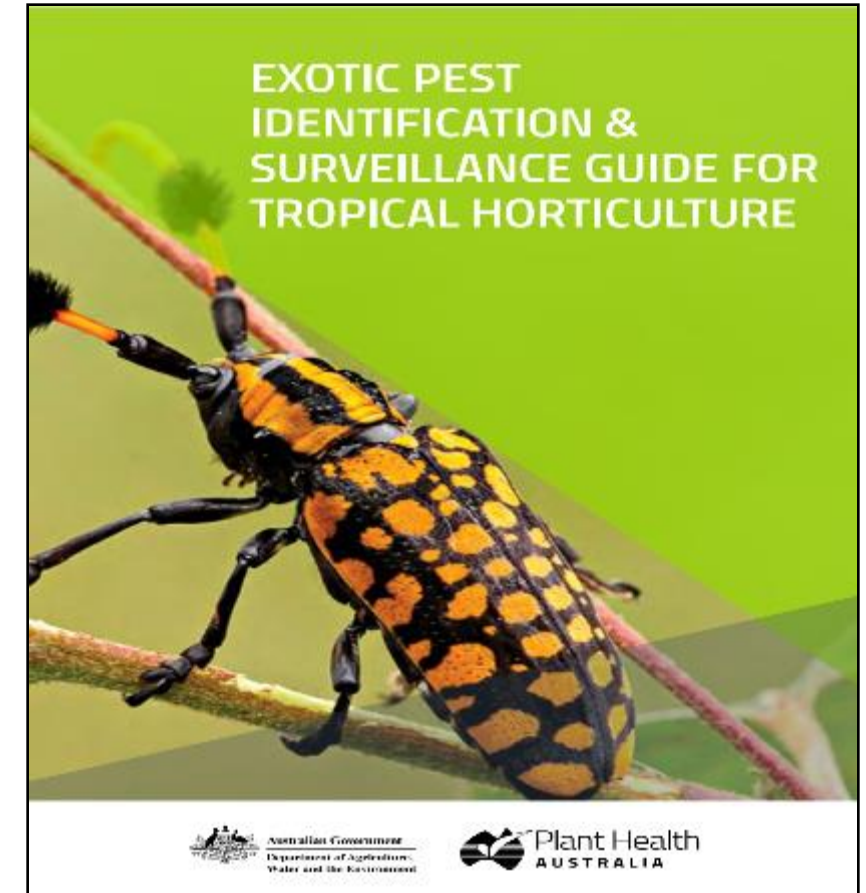
- ➔ Learn about the disease: Read your Panama TR4 Grower Kit, visit biosecurity.qld.gov.au or call 13 25 23 for more information.
- ➔ Educate your third staff on the signs of the disease using Panama TR4 Grower Disease Identification Guide. Emphasise the importance of reporting suspected plants to the team.
- ➔ Use the Grower Kit: Meet face-to-face or guide to conduct your own surveillance.

Source Credit - Surveillance for Panama TR4 - Panama disease tropical race 4 Grower Kit | Publications | Queensland Government

Post-Border (Pest Management) Surveillance Programs

- Improved pest management of **established pests** requires routine surveillance to determine population levels to improve management decisions
- Uses a mix of **specific and general surveillance programs** and general surveillance programs raise awareness about specific pests with growers and the wider community, and rely on these stakeholders to look for and report the pests during their day-to-day activities
- Most post-border targeted surveillance is undertaken by state, territory or district jurisdictions.

IPPC Fusarium TR4 Surveillance Webinar



Source Credit – Plant Health Australia: [Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf](https://www.planthealthaustralia.com.au/Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf) ([planthealthaustralia.com.au](https://www.planthealthaustralia.com.au))

Fusarium TR4 Fact Sheets to Support Surveillance

IPPC Fusarium TR4 Surveillance Webinar

Fact sheet

Panama disease

What is Panama disease?

Panama disease (also known as sheath rot) is caused by the soil-borne fungus *Fusarium oxysporum* f. sp. *cubense*.

There are four races of the fungus:

- Race 1: Affects Lady Finger, Sugar and Cucumber, but not Cavendish.
- Race 2: Causes a little leafy sheath disease that blights and kills leaves.
- Race 3: Affects only 2 banana species and not Cavendish.
- Race 4: Affects most varieties including Cavendish. There are two reported strains of this race.

Subtropical Race 4 usually produces symptoms in Cavendish after a period of cold stress. Tropical Race 4 is a serious threat to the Australian Cavendish banana industry.

Panama disease is considered to be the most destructive disease of banana in modern times. Subtropical race 4 has been under quarantine control in south east Queensland, northern New South Wales and Western Australia for some time. Tropical race 4 has been detected near Darwin in the Northern Territory and in Tully, Queensland, where it is under strict quarantine control. Both strains represent a significant risk to the North Queensland production area, but tropical race 4 is currently controlling.

Where is it now?

Race 1 – under quarantine control in banana production areas of Queensland, New South Wales and Western Australia.

Race 2 – under quarantine control in banana production areas of Queensland, and New South Wales.

Race 3 – Northern Territory.

Subtropical Race 4 – under quarantine control in banana production areas of south east Queensland, northern New South Wales and Western Australia.

Tropical Race 4 – under strict quarantine management in the Darwin area. It was detected on a single property at Tully in Queensland in 2015, and on another property in Tully in 2017.

How is it controlled?

The most effective control measure for Panama disease is the eradication of the pest and sample farm hygiene procedures.

Infected banana trees are eventually killed and plants must be destroyed because the disease can live in the soil. Minimal soil disturbance after the affected plants have been destroyed (e.g. by herbicide application) is crucial to avoid further spread of the pest via movement of soil or plant material. There are strict quarantine regulations to prevent spread of infected material to new areas through movement of soil, water or plant materials.

Have you seen signs of Panama disease tropical race 4?

Regularly examine your crop for signs of Panama disease. Early detection is a key element in controlling the pest.

In Queensland, under the Biosecurity Act 2014, Panama disease tropical race 4 is category 1 restricted matter. This means that any plants showing signs of disease must be reported to Biosecurity Queensland on 13 25 23 or your nearest police and not more than 24 hours after becoming aware of the symptoms.

Do not attempt to remove or destroy affected plants or soil, plants or objects from the area, as this increases the risk of spread.

For more information about Panama disease tropical race 4 contact Biosecurity Queensland on 13 25 23 or visit bit.ly/PanamaTR4

How do I protect my farm from Panama disease?

Prevention and farm hygiene

- Protect and currently free of the pest.
- Use clean planting material, such as tissue culture plants.
- Avoid sharing farm machinery and equipment with other growers. Accompany view of spreading Panama disease is in soil attached to equipment.
- Wash and disinfect all machinery, equipment, vehicles and footwear before entry to the farm.
- Report signs at your farm gate to notify visitors of your farm biosecurity measures.
- Formal growing areas to restrict movement of visitors, machinery and equipment.
- Train your staff and family about your farm biosecurity requirements.

If you see anything unusual, call the Exotic Plant Pest Hotline on 1800 084 881.

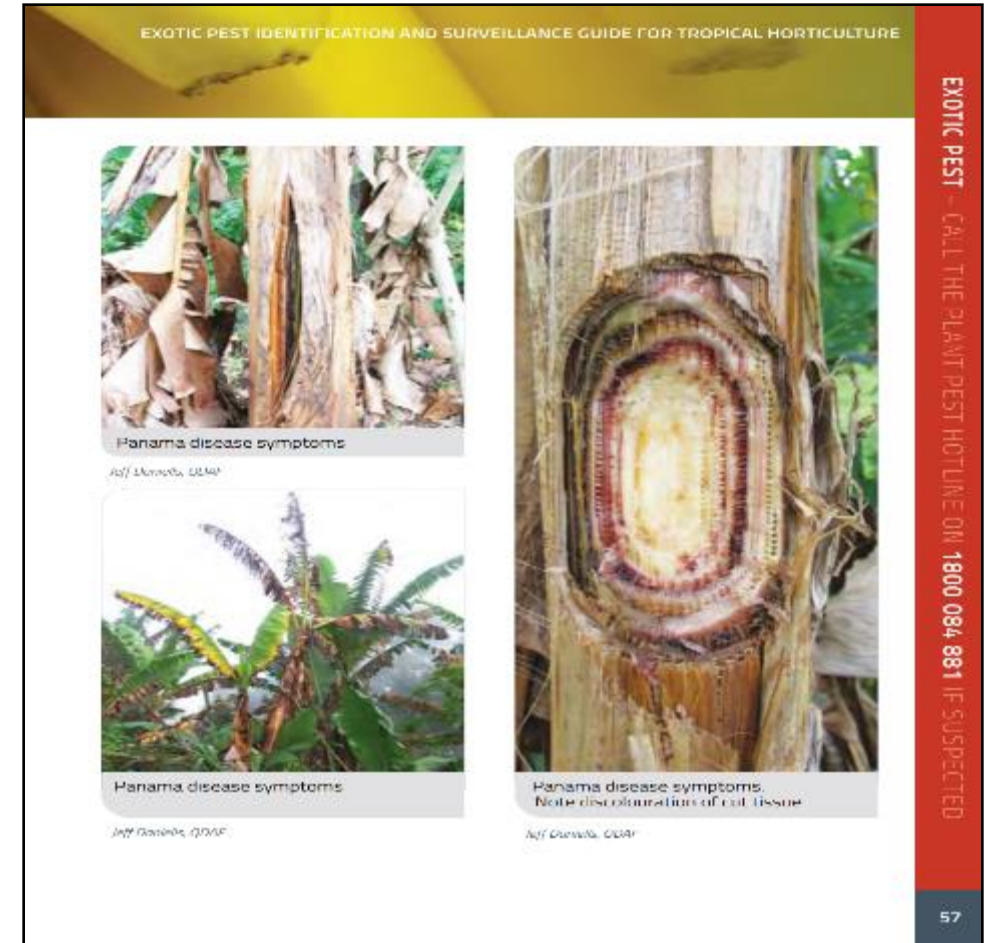
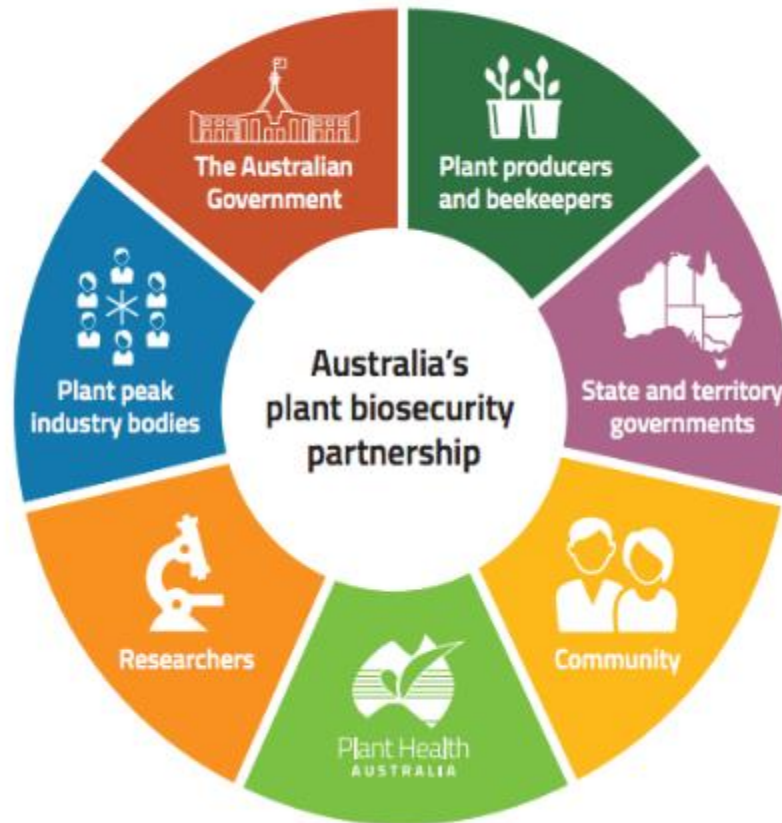
EXOTIC PLANT PEST HOTLINE
1800 084 881

Source Credit – Plant Health Australia: Panama-disease-FS.pdf (planthealthaustralia.com.au)

Plant Health Surveillance Stakeholder Partnerships

IPPC Fusarium TR4 Surveillance Webinar

Key players in the plant biosecurity partnership that protects Australia from plant pests



Source Credit – Plant Health Australia: [Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf](https://www.planthealthaustralia.com.au/Pest-Identification-and-Surveillance-Guide-for-Tropical-Horticulture-18.8.21.pdf) ([planthealthaustralia.com.au](https://www.planthealthaustralia.com.au))



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Thank you

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