Holistic approaches to overcome the threat of banana wilt disease caused by FOC TR4

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Overview

- Key Points from BAPNET Research
- Other Research within Asia Pacific
- A Global Strategy
- The Role of BAPNET/TFNet in a Global Strategy

Key Point of Focus

Four banana business models

Cavendish monoculture – multinational companies

Cavendish monoculture – small growers supplying to multinational trading companies

Diverse range of varieties – small growers supplying into a central market

Diverse range of varieties in subsistence farming systems – small farmers

Key Points from BAPNET Research

- identify the pathogen.
- the distribution of *Foc* across the region
- a large breadth of knowledge on varietal susceptibility to *Foc*. – Race 1, STR4 and TR4.
- commercial varieties that are resistant and or tolerant to *Foc*. – Race 1, STR4 and TR4.
- clean plant material
- management strategies that suppress the impact of the disease in a production system.
- all research teams are involved in field based activities
- there is light in the tunnel – but it is still a long way.

Other Research within Asia Pacific

China.

- Genetic Improvement
  - ✓ Somaclonal variants
    - Somatic mutation
    - Chemical mutagenesis
  - ✓ Traditional breeding
  - ✓ Genetic modification (chill tolerance)
- Antifungal agents – *alliums* for cropping systems

Malaysia.

- Somaclonal variants – lakatan banana

India.

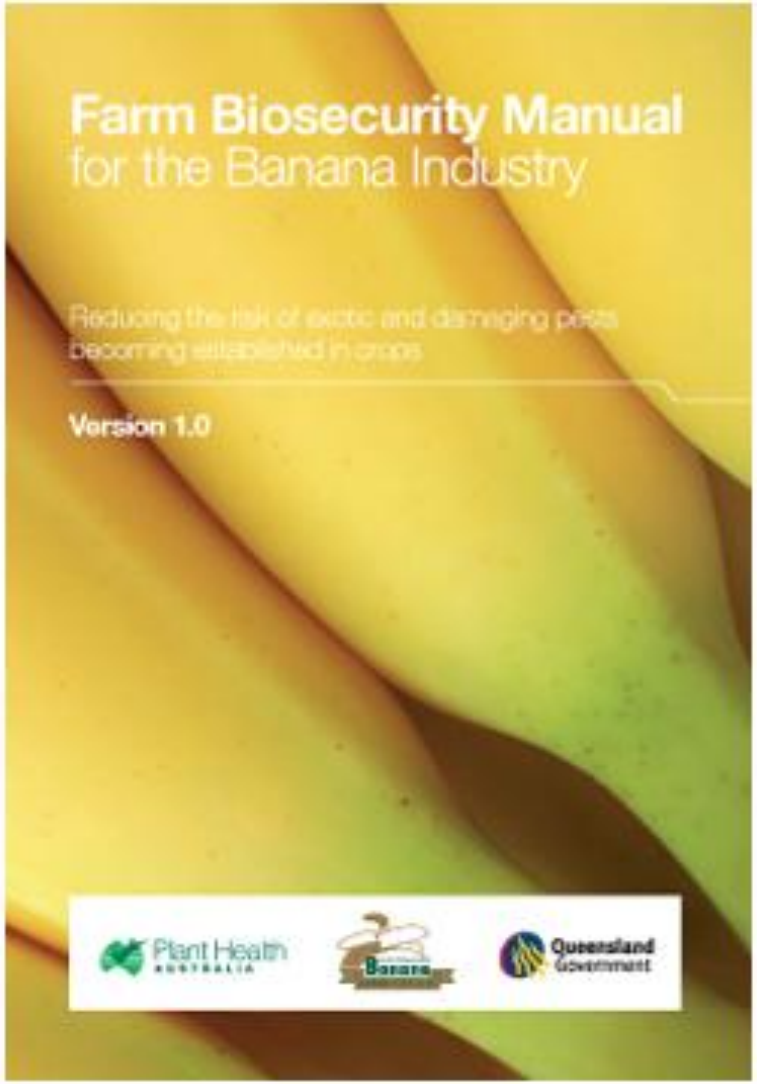
The Missing link.

The Australian Experience .

Why is it that Australia has been able to minimise the impact of these diseases on the major Production area?

Why is it that Australia does not have many of the other major Pest and Diseases of banana?

National Banana Industry Biosecurity Plan



National Banana Industry Biosecurity Plan

The plan ensures the banana industry has the capacity to minimise the risks of pests and to respond effectively to any pest threats through a pre-emptive planning process

Partnership

- Banana Industry
- Government
- Other relevant stakeholders

National Banana Industry Biosecurity Plan

Pre-Border	Border	Post-Border
• Identifying exotic pest threats • Undertaking offshore research where pest are endemic • Regulations on the importation of material	• Implementing effective quarantine • Establishing surveillance networks • Education	• Minimising risk of regional & property establishment • Preparing for detection, minimised spread • Education

National Banana Industry Biosecurity Plan

- Banana Planting Permit Policy
  - All major banana Pest and Disease move with plant material
  - Clean Planting Material critical
  - Quality Banana Approved Nursery (QBAN) scheme.
  - All growers annually need a permit to plant bananas
  - This is now run by industry not government.
  - All material must be sourced from a accredited QBAN nursery.
- Restriction on moving soil, appliances and other things into, out of or within a pest quarantine area for pests of banana plants

A Global Strategy

The Key Objectives of a Global Strategy.

1. A Biosecurity Plan (Policy)
   - Global
   - Regional – Asian Pacific/Africa/Central America.
   - National – Mozambique
   - Farm
2. Research Strategy
   - Short, medium and long term strategies.
3. Technology Transfer
   - Training from farm workers up.

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
    - Phytosanitary legalisation
    - International standards
    - Quarantine barriers
    - Farm biosecurity plans
    - Awareness
    - Understanding the impacts
    - Education

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
    - Surveillance and reporting
    - Monitoring
    - Identification, isolation and destruction.
    - Education and training

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
    - Availability
    - Certification
        - Virus indexed
        - Off-types
    - Education and training

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
4. Resistant varieties
    - Genetic improvement
        - Somaclonal variants (now)
        - Conventional breeding (long term)
        - Genetic modification (long term)
    - Regional evaluation
    - Supply chain development
    - Alternative production systems.

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
4. Resistant varieties
5. Integrated production systems
    - Inoculum reduction strategies
    - Reduction in plant stress
    - Crop rotations
    - Area-wide management programs
    - Education and training

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
4. Resistant varieties
5. Integrated production systems
6. Capacity building
    - Knowledge based on good science
    - Farm workers/leading hands/managers
    - Corporate managers
    - Extensionists/agronomists
    - Quarantine and regulatory staff
    - Policy makers & Politicians

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
4. Resistant varieties
5. Inoculum reduction
6. Capacity building
7. Collaboration
    - Sharing a common goal
    - Respect
    - Integration of a wide range of disciplines

A Global Strategy

The Key components of a Global Strategy.

1. Prevention
2. Identification
3. Clean planting material
4. Resistant varieties
5. Inoculum reduction
6. Capacity building
7. Collaboration

A Global Strategy

What can Asian Pacific bring to a Global Strategy?

We have

- 20+ years of experience of working with the disease
- The capacity to provide strategic advice
- Developed a culture of collaboration and sharing
- Systems for the development and evaluation of resistant varieties
- Capability and knowledge of production and supply chain systems
- Testing and evaluation sites
- Skilled resources

The Role of Bioversity(BAPNET)/TFNet in a Global Strategy

BAPNET

- collaborative research institutions
- strong networks
- technical information

TFNet

- an environment to increase the awareness of the impact of the disease.
- moving the technical information into knowledge and adoption.

Key Point of Focus

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The impacts of global strategy cuts across each production system


Thank you