

# Emerging plant diseases in the PICTS

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# Emerging plant diseases in the PICTS



# Endemic and Exotic Pathogens

# Banana Bunch Top Virus/ Disease (BBTV)

## Causal organism:

- Virus

## Symptoms:

- Reduced plant growth, dwarfing of suckers with reduced leaf size, leaf edge death, yellow chlorosis.
- All dwarfed suckers cluster at the base of stem
- Most times you see black aphid in the leaf folds





# Banana Bunch Top Virus/ Disease (BBTV)



## **Present :**

- New Caledonia
- Tonga
- Fiji
- Samoa

## **Transmission:**

- Infected planting material
- Black Aphid Vector
- Cutting tools

## **Control:**

- Don't import banana suckers from affected countries.
- Restrict movement of Banana planting materials.

# Fusarium Wilt (FO TR4) - Bananas

## Causal Pathogen:

- Fungus - *Fusarium Oxysporum* TR4

## Symptoms:

- Older leaves, turn yellow and droop, younger leaves show signs of wilt.
- Cut stem, continuous black coloration of vascular bundle from base to the top.
- Whole plant dies after a few days ( 7-11 days).

# Affected plant completely look different in the field of bananas





# Fusarium Wilt (FO TR4)



## Present :

- Australia
- Indonesia
- Philippines
- Not in Pacific Yet

## Transmission:

- Infected planting material
- Soil clumps
- Soil stuck in Tyres threads of trucks

## Control:

- Do not import banana suckers.
- Do not move plants, soil, farm implements from infected areas to new sites or islands.

# Recent Incursions in the Region – Symptoms similar to Fusarium wilt on bananas



1. Phytoplasma on Coconut (2009)
2. Phytoplasma on Banana (2012)
3. Phytoplasma on beetle nut (2012).

Present: PNG, USA, Caribbean Is,

Transmission:

- Infected planting material.
- Insect vectors (plant hoppers)

Control:

- Do not get planting material from PNG or affected countries.



# Phytoplasma on Coconut



## Causal pathogen:

- Coconut yellowing Phytoplasma

## Symptoms:

- Wilting of young leaves.
- Premature fall of nuts
- Old leaf yellowing, the drooping on stem, eventual death
- Free fall of crown, leaving stem standing as pole

# Phytoplasma on Banana (2012)



## Causal pathogen:

- Banana wilt associated (BWA) phytoplasma

## Symptoms:

- General bright yellowing of outer leaves (uniform), can recognise sign from far
- Reduced fruit size, sometimes necrosis of fruit and death,
- Discontinuous browning of vascular stem, yellow then brown.
- # Similar symptoms on beetle nut

# Citrus Canker (*Xanthomonas axonopodis* pv *citri*)

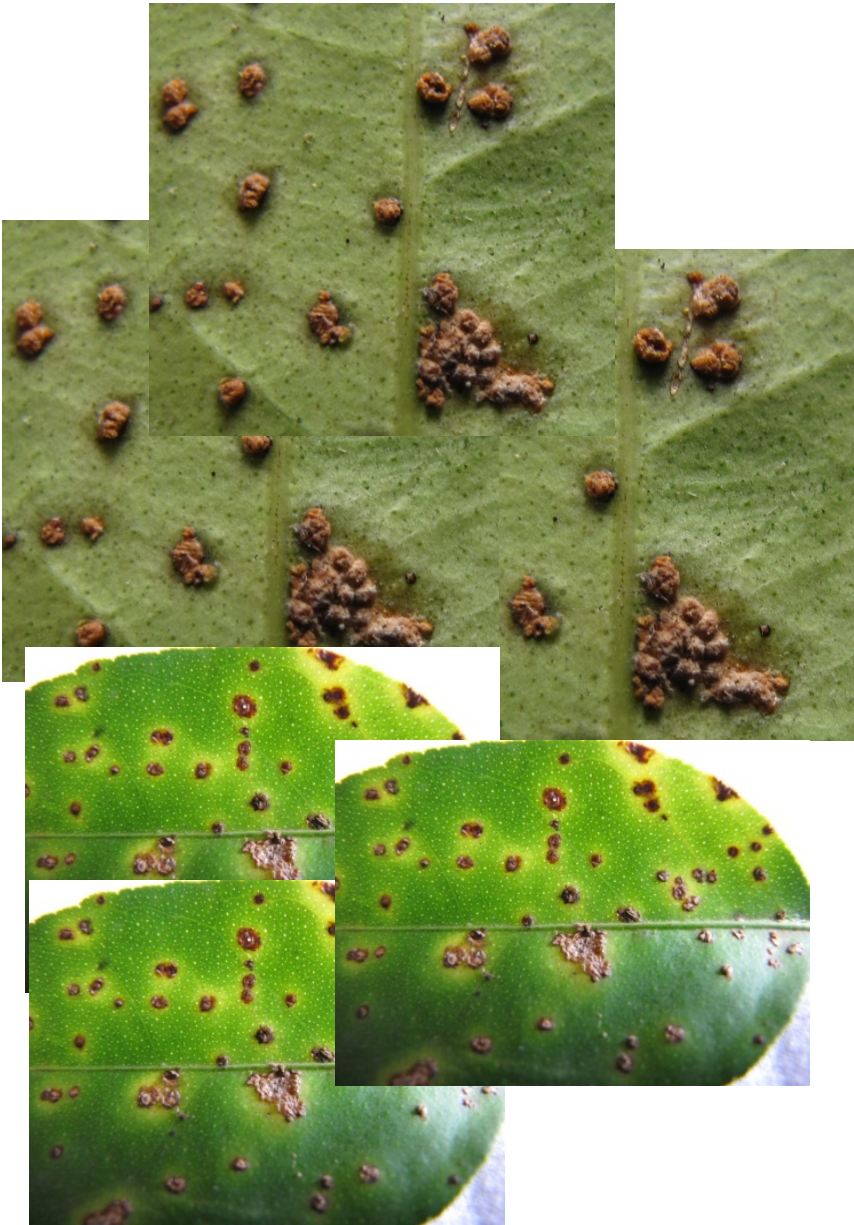
## Causal pathogen:

Bacterial disease –

*Xanthomonas axonopodis* pv *citri*)

## Symptoms:

- Leaves develop dark small lesions with rough raised contours, like volcanic craters,
- General yellowing of surrounding leaf tissue of the leaf spots
- Cankeros growth on fruit
- Early fruit and leaf drop off.
- Eventual death of tree.





# Citrus Canker (*Xanthomonas axonopodis* pv *citri*)

## Present:

- PNG
- FSM,
- Guam,
- Solomon Islands (Guadacanal).
- Palau

## Transmission:

- Infected seeds, seedlings and fruits
- Cutting tools

## Control:

- Do not move seeds, fruits, seedlings from affected countries to new places/ islands.



# Citrus Greening ( HLB) Disease



## Causal Pathogen:

- Bacteria disease - *Liberibacter asiaticus*

## Symptom:

- Chlorotic yellowing of leaves of one branch, the spread gradually top other branches.
- Affected leaves with corky vein symptoms, and fall/drop off prematurely.
- Uneven fruit size, when cut open.
- General wilt, then eventual plant death.



# Citrus Greening ( HLB) Disease

## Present:

- PNG# Disease present.
- Citrus Psyllid - vector , recorded in N. Marianas, Guam, A. Samoa and, most recent in Samoa (May 2012).

## Transmission:

- Infected planting material
- Vector, citrus psyllid
- Cutting tools

## Control:

- Do not get seedlings from those infected places.





# Bacterial Crown Rot on Papaya



## Causal Pathogen:

- Bacterial disease - *Erwinia papayae*, *Erwinia malatovora*

## Symptoms:

- Black necrotic water soaked lesions develop on leaf, fruit, stem (green tissue on crown), quickly spread covering more tissue, blackening, most times crown is blown off leaving fruits and older leaves.
- Affected tissue rots producing foul smell, attracts lots of flies.
- Fields of papaya can be destroyed in a couple of days during epidemics.

# Bacterial Crown Rot on Papaya



## Present:

- Tonga
- Malaysia

## Transmission:

- Infected seeds
- infected seedlings,
- cutting tools,
- strong will with rain

## Control:

- Do not obtain seedlings, seeds from affected countries.

# Chili Pod rot – Chili Anthracnose disease



## Causal pathogen:

- Fungal disease - *Colletotrichum* spp.
- (*C. acutatum*, *C. capsisi*)

## Symptoms:

- Black necrotic lesion on fruit, develop into concentric rings with raised contours, centre of lesion dry, with black fungal masses.
- Moist conditions , grey white fungal growth on edges of lesions.
- Affect all fruiting stages

## Present:

- Fiji
- Australia,
- South east Asia



# Chili Pod rot – Chili Anthracnose disease



## Transmission:

- Infected seeds
- Rain driven wind
- Infected seedlings

## Control:

- Use clean seeds
- Do not import seeds from affected countries
- Use Anthracnose tolerant varieties
- Spray with protected fungicides ( mancozeb, 2.5 g/l, bravo 2 g/l )  
only when grown on large scale

# Breadfruit rots



## Causal Pathogen:

- Fungal disease - *Phytophthora palmivora*, *Colletotrichum* sp.

## Symptoms:

- Fruit show small dark lesions, blacken , then spread quickly through fruit, soften it.
- Affected fruits show white fungal growth on edge of lesion in cool weather.
- Affected fruits drop prematurely.
- during dry periods, affected fruits dry/mummify on branch.
- Branches/twigs die back

# Breadfruit Rot

## Present:

- Marshall Islands, FSM (Phonpei), Kiribati.

## Transmission:

- Infected seeds.
- Infected fruits.
- Infected seedlings – vegetative planting materials.
- Wind driven rain.

## Control:

- Do not obtain seeds, planting materials from affected countries.
- Import planting material in tissue cultures.





# Coconut Rhinoceros Beetle – G strain

## **Present:**

- Guam
- Hawaii
- Solomon Is
- PNG

## **Attacks:**

- Coconut palms
- Oil palms
- Beetle nut palms

## **Threat:**

- **All other Pacific Island Countries**
- Current Biological Controls – Virus doesn't work

# What Can We Do?

1. Restriction on the movement of plants through stringent inter island Biosecurity/ Quarantine Laws.
2. Vigilant Inspection (seaport/ Airport).
3. Awareness (posters, etc.,) Educating our farmers, Educating school children and the general public.
4. Regular Surveillance/monitoring.
5. Collaborative Research investigations on possible management options.
6. Traditional Knowledge.
7. Ongoing collaboration with existing primary stakeholders/ players – **“ADVOCATING IMPORTANCE OF PLANT PESTS AND DISEASES & BIOSECURITY”**.

# Vinaka

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