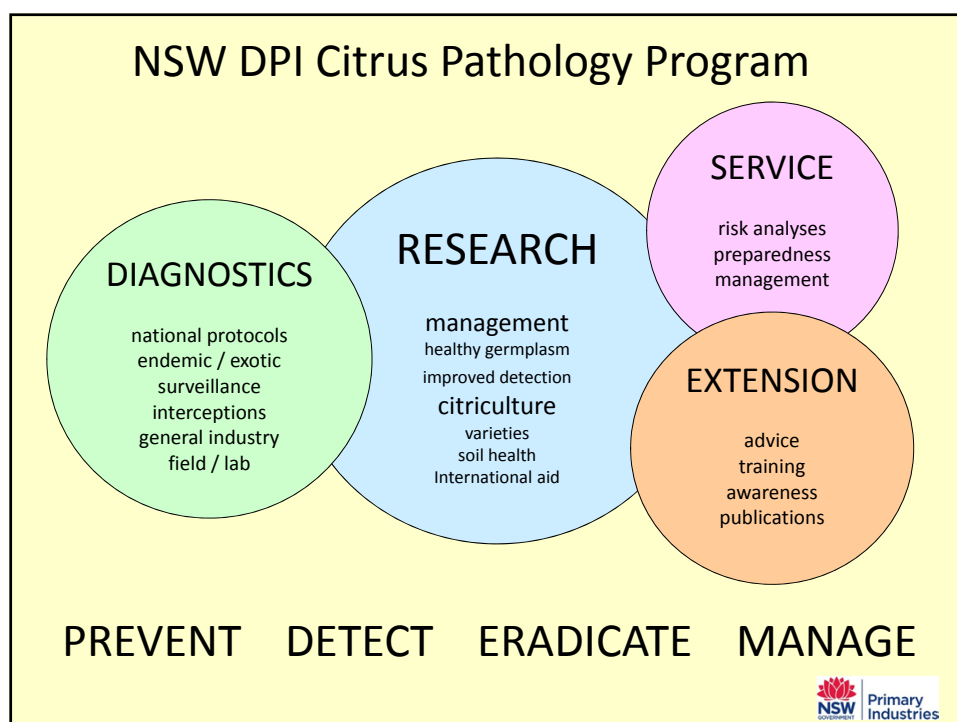
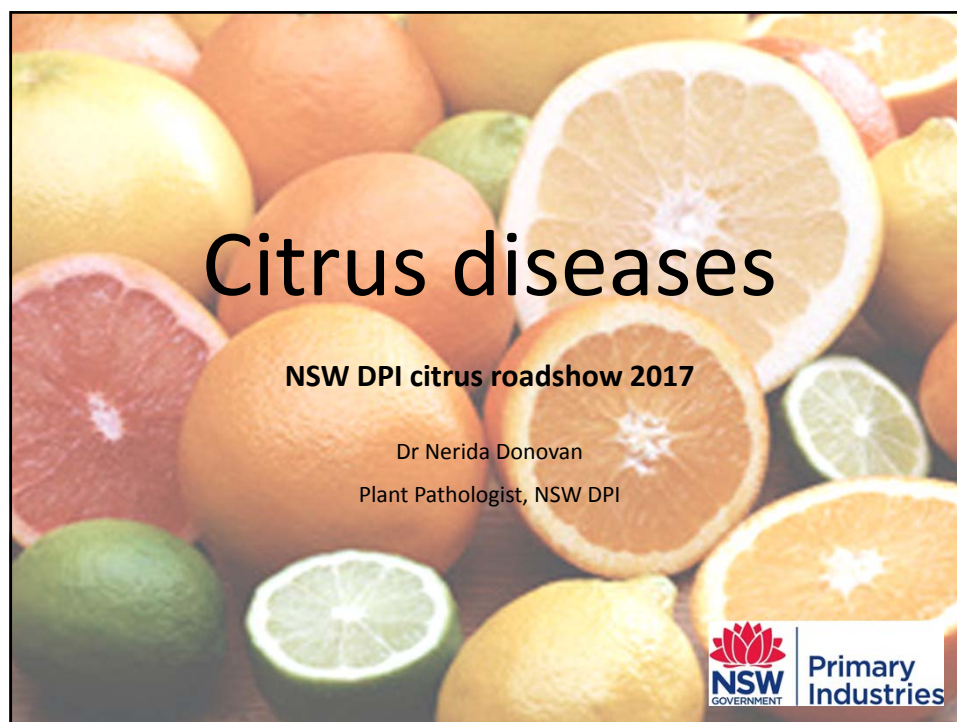




Citrus Pathology Program team

EMAI, NSW DPI



The diagnostic process

If possible, speak to a plant pathologist

Send photos – environment + problem

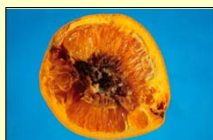
Ask what to send and how to send it

The RESULT may not be the ANSWER

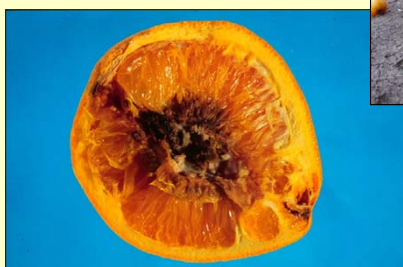
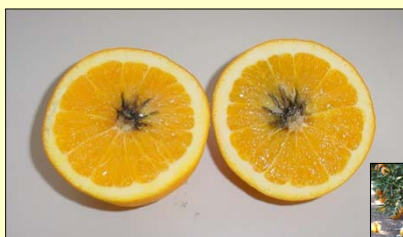
PRIMARY CAUSE vs SECONDARY INVADER



Black core rot research



Alternaria black core rot



Black core rot

Fungus: *Alternaria* sp.

spores found throughout canopy – air-borne

dead wood

rotten fruit

if you get 1-2 days of

warm temps (>25°C)

strong winds

low RH (<20%)

with heavy dews in evening

→ cracks in stylar tissue → entry point for fungal spores

‘quiescent infection’ - waiting for the opportunity to be active

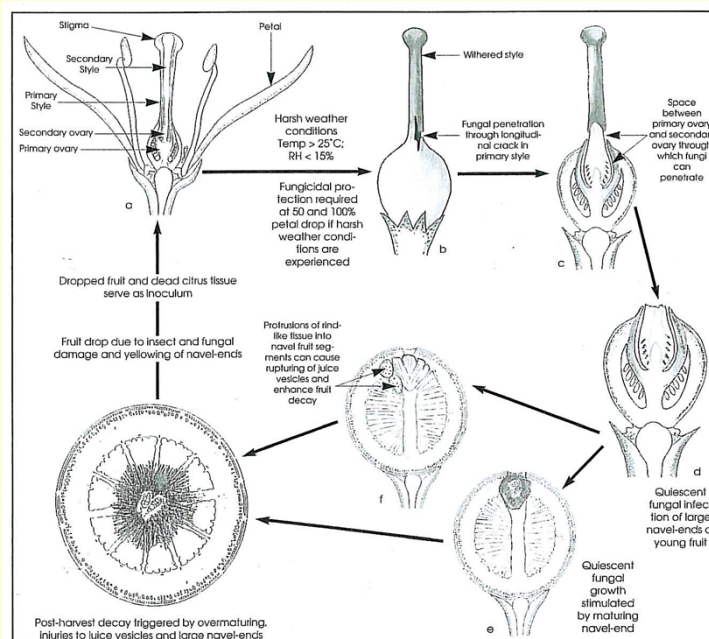
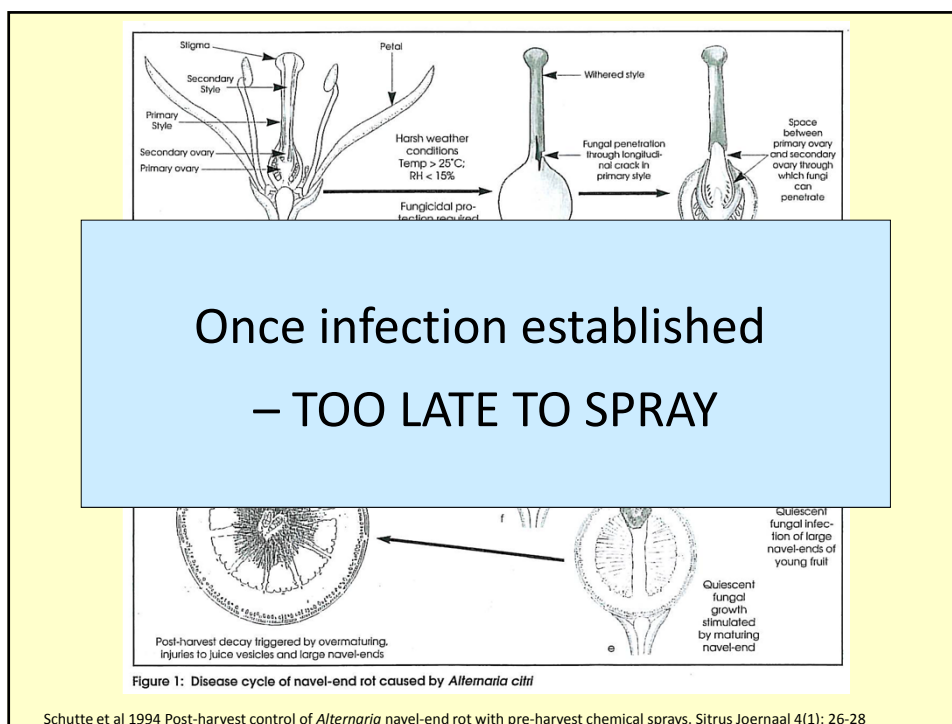


Figure 1: Disease cycle of navel-end rot caused by *Alternaria citri*

Schutte et al 1994 Post-harvest control of *Alternaria* navel-end rot with pre-harvest chemical sprays. *Sitrus Joernaal* 4(1): 26-28



Black core rot

Large navel end openings

↑ susceptibility navel-end fruit splitting

↑ navel-end rot

refuge for insect pests

Impact

fruit may colour prematurely

off-flavours

black fragments in juice

may be discoloured at stylar end

BUT infection not always detected before sale



Management of black core rot

Prune to remove dead wood / skirts

Delay harvest to let affected fruit fall

South Africa

- systemic fungicide spray at 50% and 100% petal fall

difenoconazole and tebuconazole

- 2,4-D at full bloom

Australia

need trials and chemical registration



Spray trials

Riverina and Sunraysia – NSW DPI funded

Treatments

1. Amistar®
2. copper oxychloride + Amistar®
3. Score®
4. copper oxychloride
5. Amistar Top®
6. control = no petal fall spray

Assessment

Fallen fruit and harvested fruit



Spray trials



Riverina and Sunraysia – NSW DPI funded

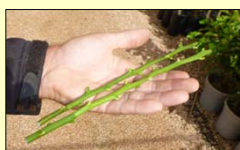
**NO SIGNIFICANT
DIFFERENCE**

Fallen fruit and harvested fruit



Graft-transmissible diseases

What's in your budwood?



Graft-transmissible diseases in Australia



reduced
yield and
quality

stunting



TREE DEATH



Graft-transmissible diseases in Australia



reduced
yield and
quality

NO CURE



TREE DEATH



Impact of CEV infection

Trials showed ↓ yields

- navel on citrange ↓ by ~50% = ~\$24k / ha

- navel on tri ↓ by ~69% = ~\$17k / ha

assume 40 t / ha @ \$600 / t

Cost of orchard establishment ~\$30k

Auscitrus bud adds \$0.55 to cost of nursery tree



START WITH A CLEAN TREE

Introduce mild dwarfing to a high density planting in field



Auscitrus provides citrus scion budwood and rootstock seed:

- true to type
- healthy

It is important that budwood is available of varieties required by the market place.

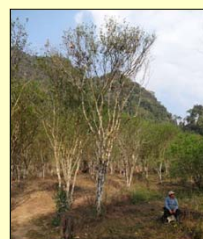
Public and private varieties are included in the scheme.



Research support for Auscitrus

Protecting Australian citrus germplasm through improved diagnostic tools

- Pathogen collection
- Detection
- Surveillance
- Awareness
- Resource



Quarantine restrictions

Legislation prohibits the movement of citrus plant material from Qld

Orange stem pitting (OSP) – only known to occur in Qld

Mandarins are symptomless carriers

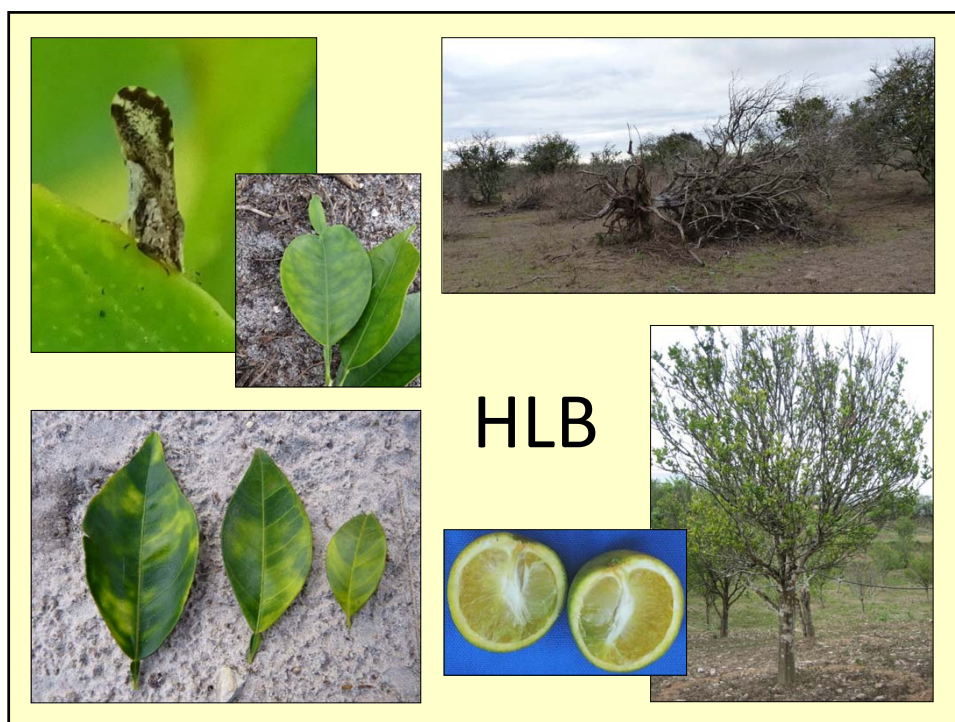
OSP would impact national orange production if spread south

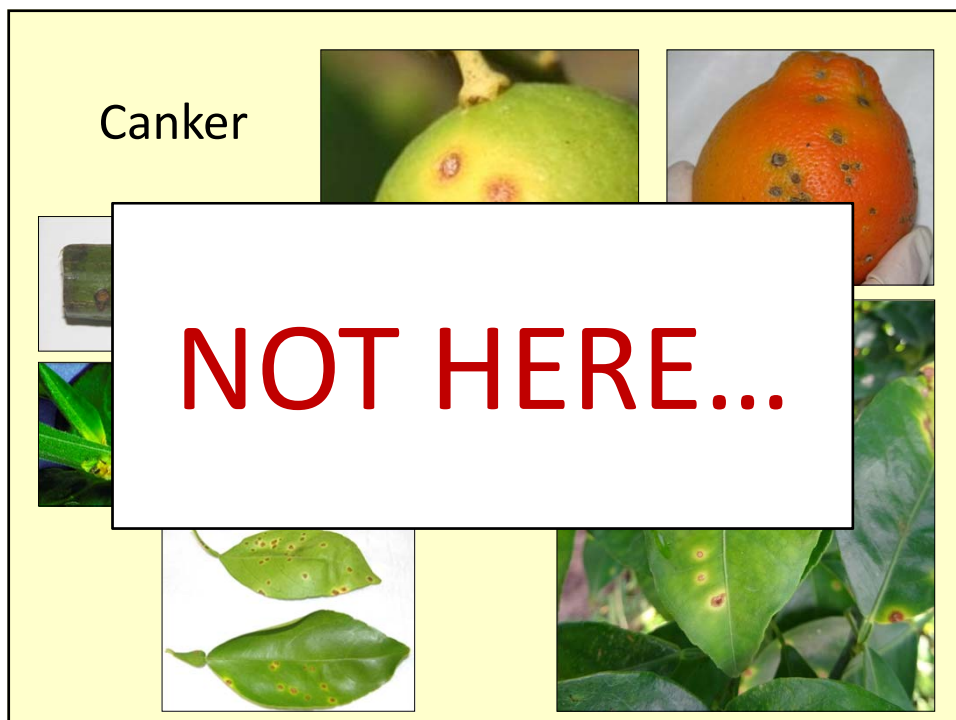
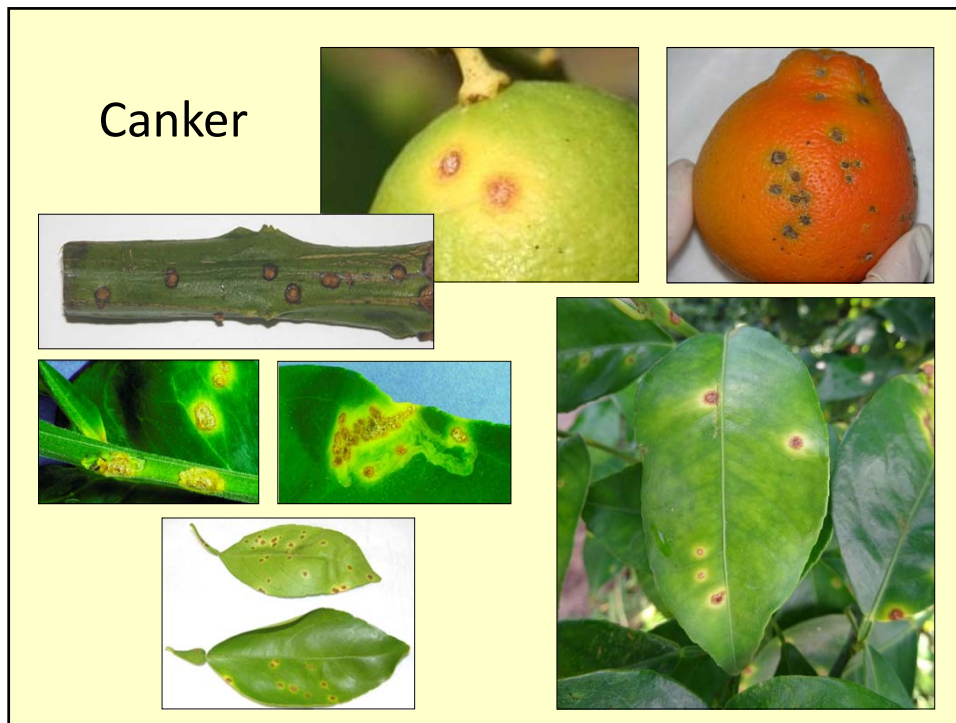
REDUCE SPREAD TO REDUCE IMPACT



Exotic threats



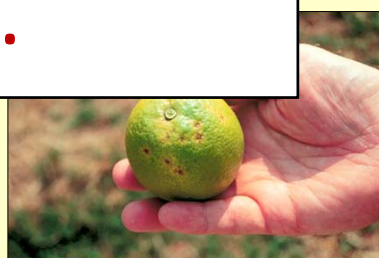
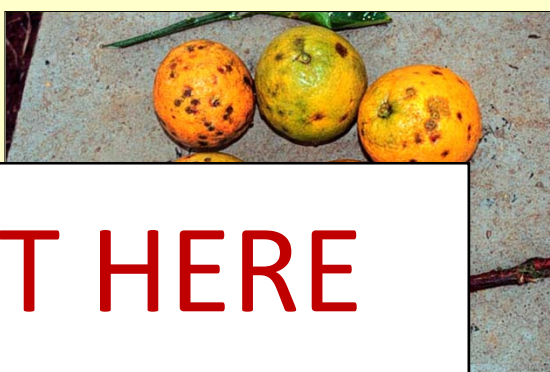




Leprosis



Leprosis



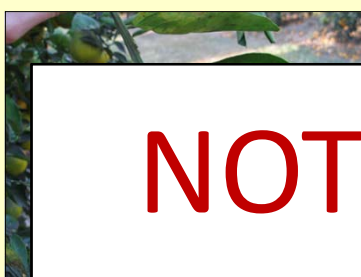
NOT HERE
yet...

Citrus variegated chlorosis (CVC)



©Andrew Miles

Citrus variegated chlorosis (CVC)



NOT HERE
yet...

©Andrew Miles