

# Stubble management – implications for disease

SOUTH  
AUSTRALIAN  
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**PIRSA**

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Stubbles Extravaganza, 9<sup>th</sup> November 2017



# Know before you sow





# Crown rot



Upper North Farming Systems Group, Booleroo Centre

SARDI

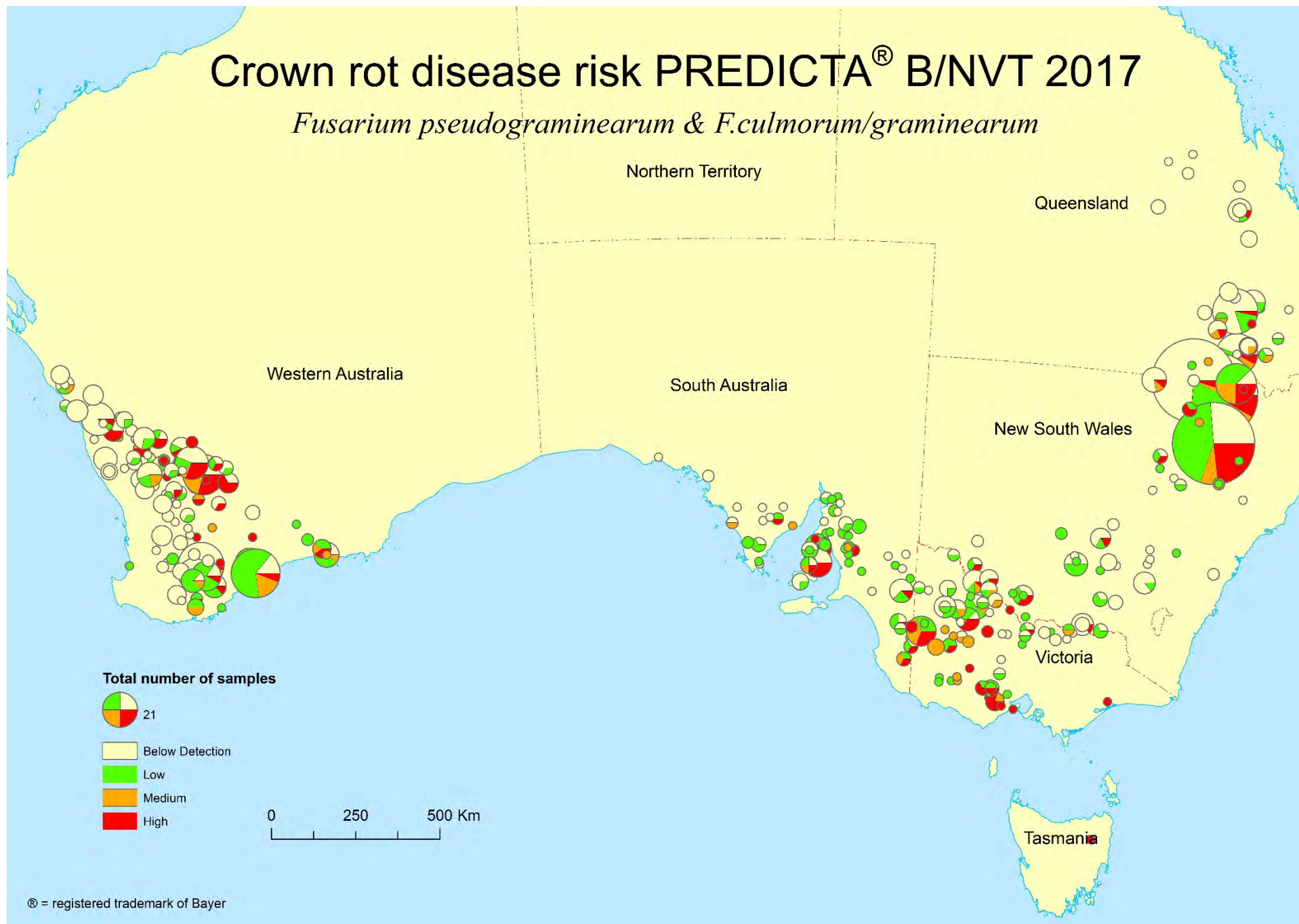






# Crown rot disease risk PREDICTA<sup>®</sup> B/NVT 2017

*Fusarium pseudograminearum* & *F.culmorum/graminearum*



# Magnitude of effects on yield

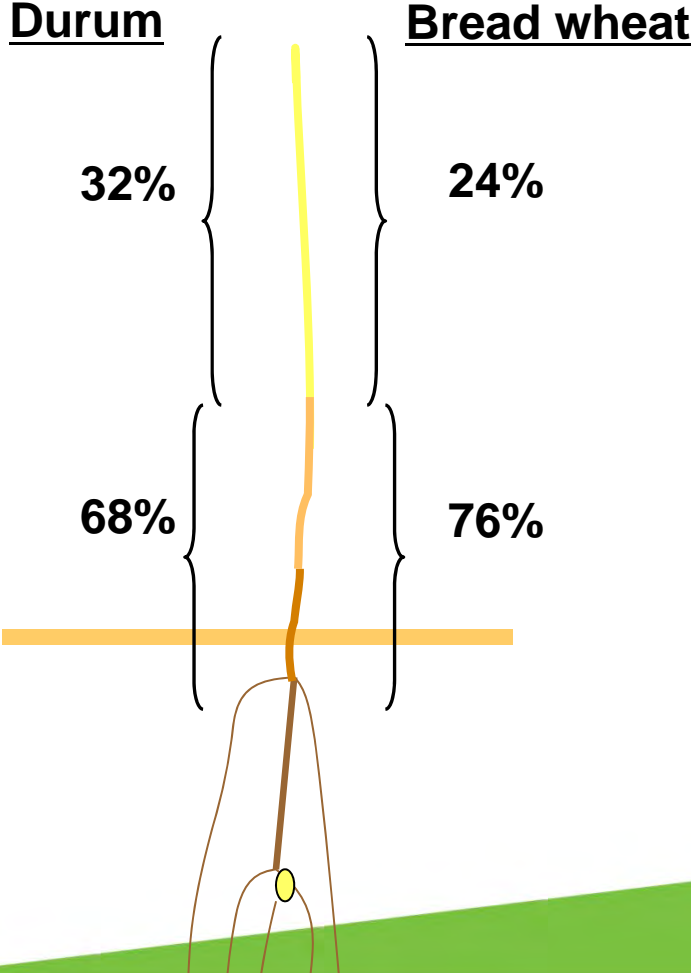
Assuming a medium/high crown rot risk and bread wheat as the crop

## Environment: 5-55% yield decrease

Change in yield from:

Halving the inoculum level	= 10-20%↑
Changing cereal type	= 10-40%↕
Changing variety	= <20%↕
Sowing on the inter-row	= 5-15%↑
Applying fungicides	= 0%?

# Inoculum in cereal stubble



The concentration of pathogen DNA in plant material is highest at the base of the stem.

# Burning (Pinery fire)





# Sowing on the inter-row

Yield improvement of: 11% for bread wheat; 33% for durum



# The future for crown rot research

- Effects of disease combinations
- Using new technology to understand the mechanisms of yield loss – proof of concept
  
- Raising awareness
- Timely reminders



# Eyespot



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# Eyespot population density PREDICTA<sup>®</sup> B/NVT 2017

*Oculimacula yallundae*

Northern Territory

Queensland

Western Australia

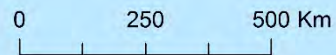
South Australia

New South Wales

Victoria

Tasmania

Total number of samples



® = registered trademark of Bayer

# Management

- Rotation (2 years out of cereal)
- Fungicides (none registered in Australia)
- Varietal resistance (limited)
- Burning infected stubble





# Research priorities (GRDC Local Forum, Minlaton, June 2017)

- Varietal resistance and hosting of disease
- Fungicides (including when not needed)
- Lifecycle/biology/incidence/spread/climatic effects
- Best practice management/decision tree/prediction
  
- ID of paddocks at risk/prediction of risk
- Soil type effect/inoculum spatial variability in paddocks
- Awareness/identification
- Rotation
  
- Nutrition (especially N)
- Stubble management (not burning)/stubble loads
- Biosecurity: risk of spread e.g. on vehicles

# White grain disorder (WGD) - an export issue



**White grain disorder**



**Fusarium head blight**

University of Minnesota FHB scoring standard



# Signs and symptoms



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# First experiences - 2010-2011

**Tonnes affected, 2011 : 174,370**

Eyre Peninsula 100,315

Rest of South Australia 74,055

Data courtesy of Viterra

## Incidence in commercial grain

Range: <2%-15%

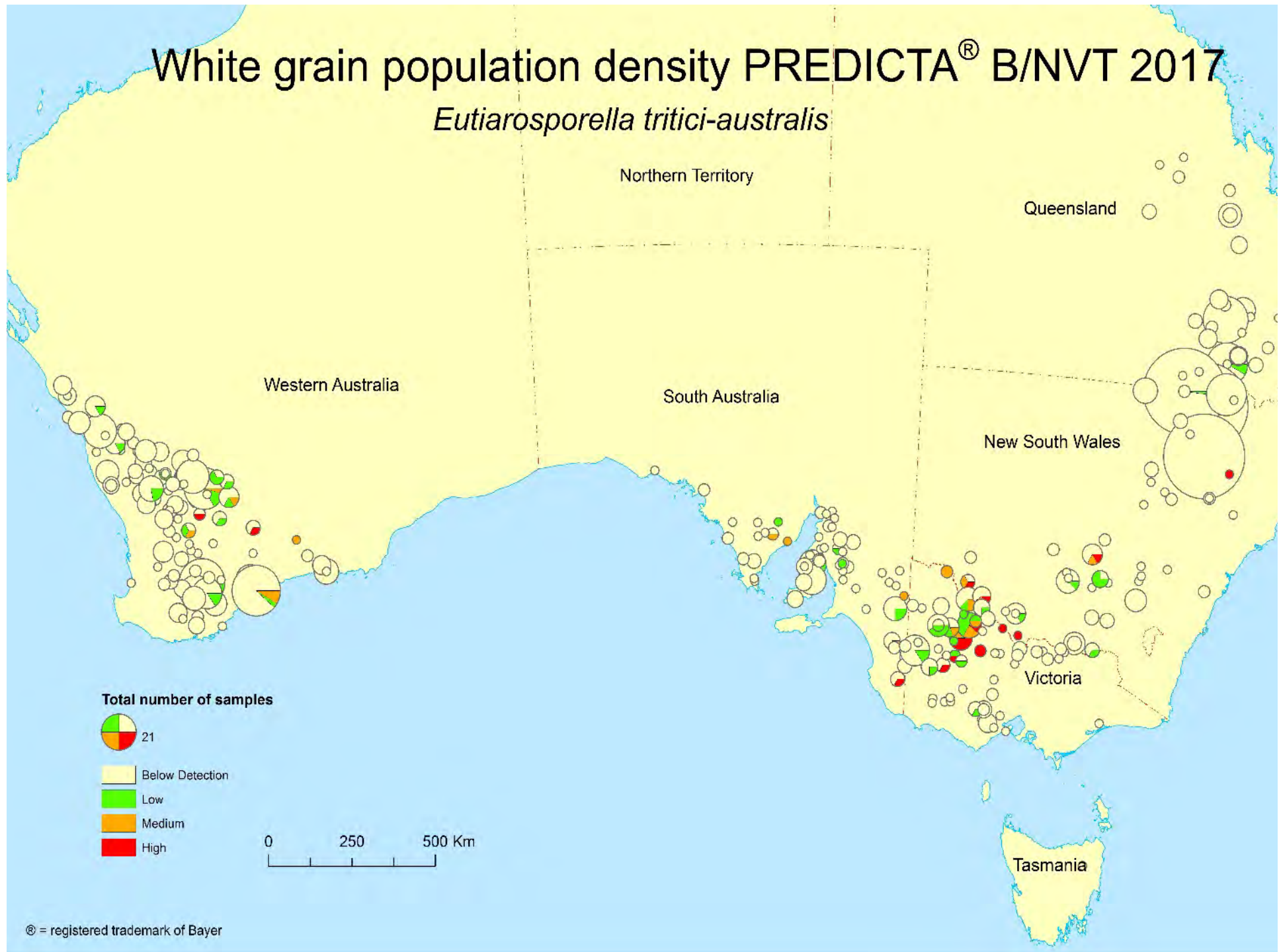
Most common: 3%-7%

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# White grain population density PREDICTA<sup>®</sup> B/NVT 2017

*Eutiarosporella tritici-australis*



# The known and the unknown

- Identification
- Toxins
- Epidemiology
- Resistance screening
- Fungicide efficacy
- In-paddock inoculum levels
  
- Alert industry pre-harvest in high risk years



# Net form net blotch



Image - Hugh Wallwork



Image - Hugh Wallwork



# Spot form net blotch



Hugh Wallwork – Wharminda yield loss trial

Hugh Wallwork – Wharminda yield loss trial



# Yellow leaf spot



Image - Hugh Wallwork



Image - Hugh Wallwork



Image - Hugh Wallwork

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Hugh Wallwork – Wharminda yield loss trial



# Timely reminders needed for all



Cleve 2014



# Funding

## Grains Research and Development Corporation

- DAS00136 “New fungicide technologies for crown rot management.”
- DAS00137 “National improved molecular diagnostics for disease management.”
- DAS00139 “Improving grower surveillance, management, epidemiology knowledge and tools to manage crop disease in South Australia.”
- DAS00154 “White grain disorder in wheat.”
- DAN00175 “National crown rot epidemiology and management program.”

## South Australian Grains Industry Trust

- S1206 “Strategies to reduce white grain on Eyre Peninsula.”
- S517 “Further development of crown rot resistance in durums.”