



Grains Biosecurity Investments: Helping to support Australia's biosecurity system.

Callum Fletcher

Manager – Biosecurity



OUR GRAINS INDUSTRY

AT A GLANCE

20,915
levy payers¹



\$16.9 billion
gross value of
grains production⁴
5 year average



46.8 million

tonnes of grain produced⁴
5 year average



21.7 million
hectares crop sown⁵
5 year average

Grain farms generate
~\$1 million
gross receipts per
full time equivalent⁶



25%
of Australia's total gross
agricultural value⁷
5 year average

34,000
people employed on grain farms⁸



Australia represents the following % global exports



Chickpeas¹⁰



Barley⁹



Canola⁹



Oats⁹



Sorghum⁹



Wheat⁹
5 year average

30% of farms produce
73%
of Australia's grain¹¹



4% average
rate of return
for Australian
grain farmers
(excl. capital appr)¹²
5 year average



45%
farms have a vegetation plan
for biodiversity or amenity benefit¹³

70%
farms retain crop residues¹⁴

2005
greenhouse
gas baseline: **315 kg**
of CO₂e per tonne
of grain, representing

1.7%
of all Australian
GHG emissions¹⁵



Total Plant Machinery
Labour costs represent

~37%

of income for Australian grain farms¹⁶

Variable costs represent

~50%

of income for Australian grain farms¹⁶

Top
20%
Australian grain
farms are

2x
more profitable
than the average¹⁷

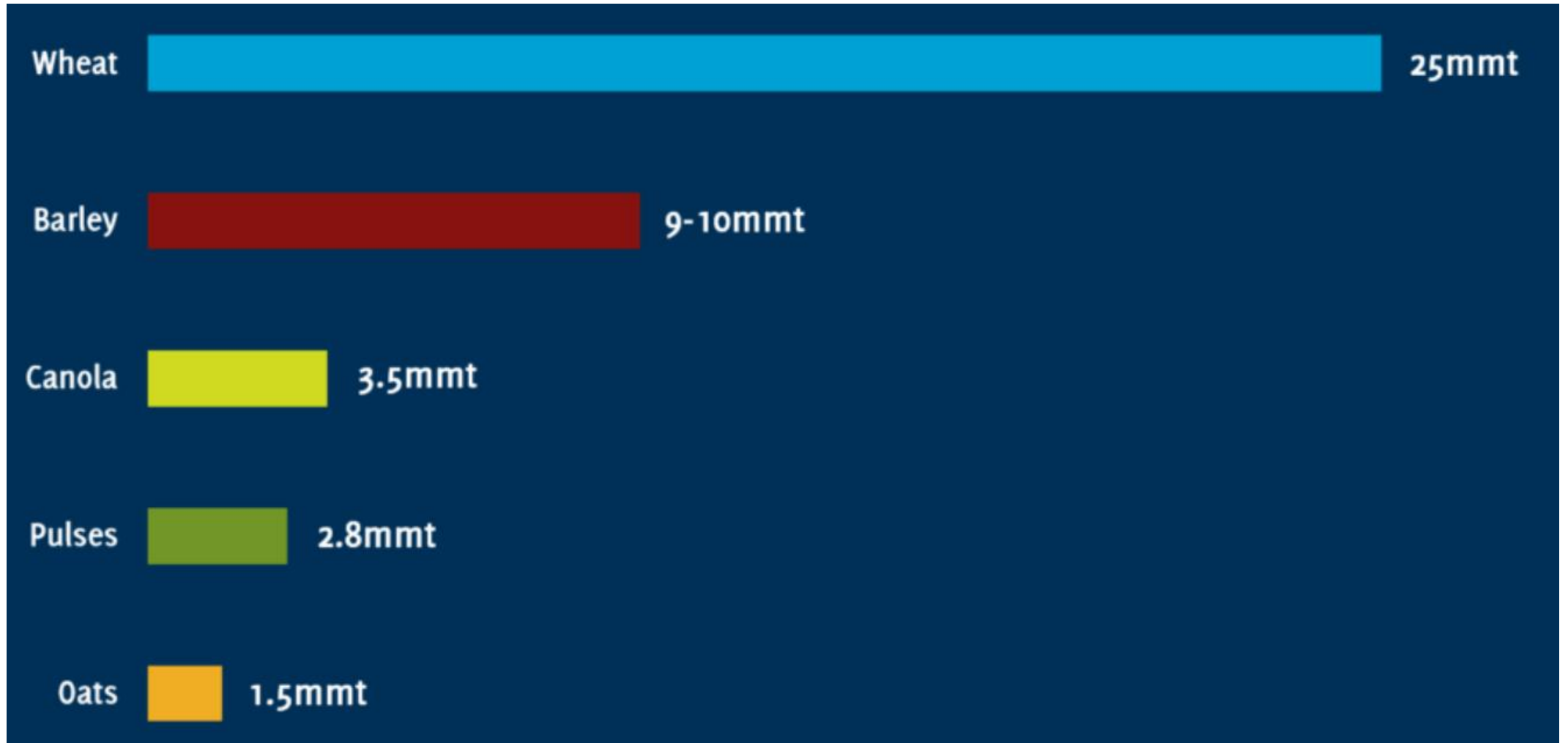


1.9% p.a
growth
in total factor productivity
of cropping farms,
climate adjusted¹⁸



Australian Grain Production

Major Crops



Investment and impact in 2020-21

\$168.9m

Total investment
expenditure

602

Total number of
active investments

Investments by objective - Number of investments and investment value

\$68.9m

Objective 1

\$9.3m

Objective 2

\$61.8m

Objective 3

\$1.7m

Objective 4

\$1.5m

Objective 5

14%

Percentage new investment
(\$23.2m)

\$145m

Ongoing investments

Investment and impact in 2020-21

Intellectual property statistics

Patents and trademarks, Plant Breeders' Rights (PBRs), new varieties

24

patent families across

43

countries

110+

Commercial agreements including

3

new agreements

126

Plant Breeder's Rights across

20

crop species

\$41m

royalty revenue

13 **GrainInnovate
investments**

For every dollar invested by GRDC over \$15
of co-investment has been contributed by
Artesian and other sources

21

trademarks

Five years at a glance

						
	Revenue	Expenditure	Operating result	Total assets	Total equity	Industry contributions
2020–2021	\$244.0m	\$203.6m	\$39.9m	\$324.6m	\$276.9m	\$157.3m
2019–2020	\$173.2m	\$218.7m	(\$45.9m)	\$279.3m	\$217.5m	\$95.8m
2018–2019	\$206.9m	\$206.5m	\$0.26m	\$297.3m	\$263.0m	\$114.1m
2017–2018	\$213.8m	\$219.8m	(\$6.5m)	\$268.2m	\$199.4m	\$117.3m
2016–2017	\$242.4m	\$227.7m	\$14.8m	\$307.2m	\$205.8m	\$139.4m

Source: GRDC Annual Report 2020-21

Five years at a glance

					
	Commonwealth contributions	R&D expenditure	Employee benefits	Suppliers	Number of projects
2020–2021	\$68.8m	\$168.9m	\$14.4m	\$12.1m	602
2019–2020	\$59.4m	\$182.4m	\$13.6m	\$16.9m	719
2018–2019	\$69.3m	\$174.0m	\$13.3m	\$16.6m	767
2017–2018	\$71.3m	\$192.1m	\$13.2m	\$10.5m	742
2016–2017	\$73.3m	\$198.1m	\$10.9m	\$11.6m	700

Source: GRDC Annual Report 2020-21

Outlook towards 2040



30.6m

people
living in
Australia¹



1.4b

extra mouths
to feed globally¹



39%

global
population
growth in
Asia¹

32%

Electric
vehicles
to represent
new passenger
vehicle sales
globally by 2030²



Carbon intensity
of ships to be
cut by 40%
by 2030¹

(International Maritime Organisation)

Additional
13.7m
tonnes of wheat demand
across Indonesia, Philippines,
Thailand and Vietnam¹
by 2030



More
people
will die
prematurely
from over-consumption
than perish from starvation¹

India
will import between
6-11m
by 2030

tonnes
of pulses
p.a.¹



Additional
2.9m
tonnes stockfeed

0.8m

tonnes grain for food
required domestically¹



1. Kingwell, R. (2021). Grains industry supply/demand drivers and trends: Considerations for Australian grains RD&E. Report to GRDC by the Australian Export Grains Innovation Centre (AEGIC)

2. Deloitte (2020). Deloitte Insights: Electric vehicles. Setting a course for 2030. Deloitte University EMEA CVBA, B-1831 Diegem, Berkenlaan 8b.

Investment areas

PILLARS

FOCUS AREAS

HARNESS EXISTING POTENTIAL

Growers hit yield & profit targets, across every paddock, every season.

- ▶ Right crop & cultivar.
- ▶ Biosecurity, weed, pest & disease control.
- ▶ Optimise crop nutrition & improve soils.
- ▶ Systems integration for reliable profit.

REACH NEW FRONTIERS

Productivity of crops exceeds what we thought possible.

- ▶ Step-changes in water & soil productivity.
- ▶ Unlock plant potential.
- ▶ Transform efficiency of input use.

GROW MARKETS & CAPTURE VALUE

Growers have access to the markets they want & get more for the crop.

- ▶ Enduring access to the markets we want.
- ▶ Add value to the crop to increase margins.
- ▶ Lower post-farm gate costs.

THRIVE FOR FUTURE GENERATIONS

Australia's grains industry remains a global leader in sustainability, for people, the planet & our long-term ability to farm.

- ▶ Sustainable, responsible production systems.
- ▶ Support communities & social licence.

FOUNDATIONAL ENABLERS

Knowledge transfer & adoption

Capacity & ability

Data & insights

Innovative partnerships



GRDC Biosecurity

GRDC takes a whole of system approach, recognising that biosecurity is a shared commitment that begins within the farm gate, but also embraces all areas of the biosecurity continuum.

Investments covering preparedness, response, surveillance and diagnostics make up the majority of resource allocations.



GRDC Biosecurity Framework

Strategic Elements

Identify, understand and prioritise risks



- Support prioritisation of biosecurity threats to the grains industry
- Contribute to better understanding biosecurity threats including data capture and analysis
- Support the regular review and prioritisation of biosecurity threats to best support preparedness.

Preparedness



- Contribute to minimising priority exotic biosecurity risks through preparedness activities
- Co-invest in rapid, accurate and cost-effective detection tools for high priority pests, weeds and diseases
- Develop human and technical capability in plant biosecurity to support our plant industries into the future
- Collaborate on increasing grains biosecurity awareness and practices.

GRDC Biosecurity Framework

Strategic Elements

Surveillance



- Coordinated, collaborative (where applicable cross industry) and cost-effective surveillance to support optimal management of priority biosecurity threats
- Contribute to the implementation of the National Grains Biosecurity Surveillance Strategy.
- Improve surveillance across the biosecurity continuum both domestically and internationally.

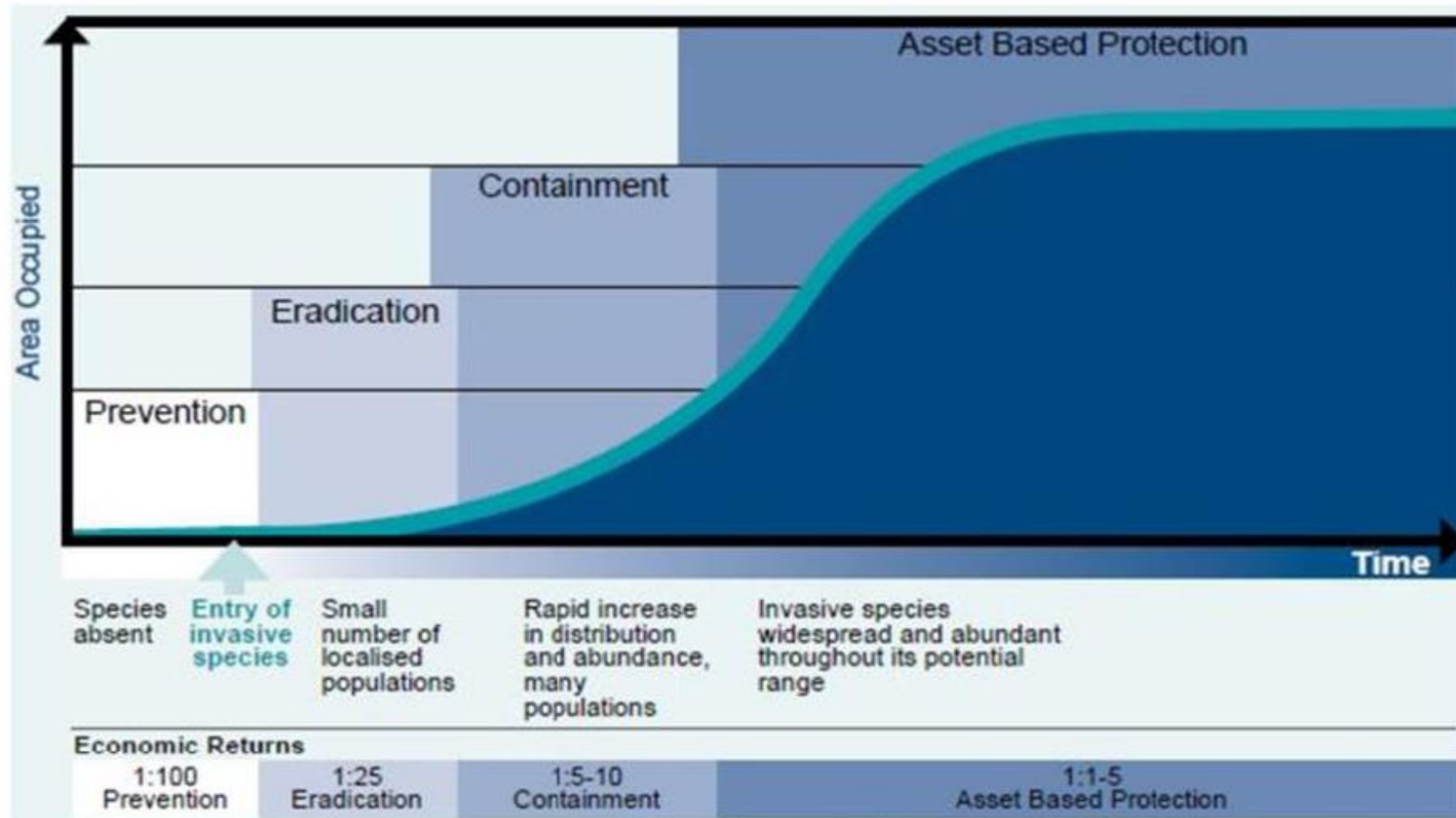
Sustainable management



- Invest in pre-emptive and proactive management options for exotic and established biosecurity threats minimising adverse impacts of biosecurity incidents to production, trade and the environment.

Australian Biosecurity System

Economic return along the invasion curve



Source: Biosecurity Strategy for Victoria, 2009

- Prevention at pre-border or border is cost effective.
- Eradication and containment increase costs but protect unaffected areas.
- Establishment increases costs for all of industry.

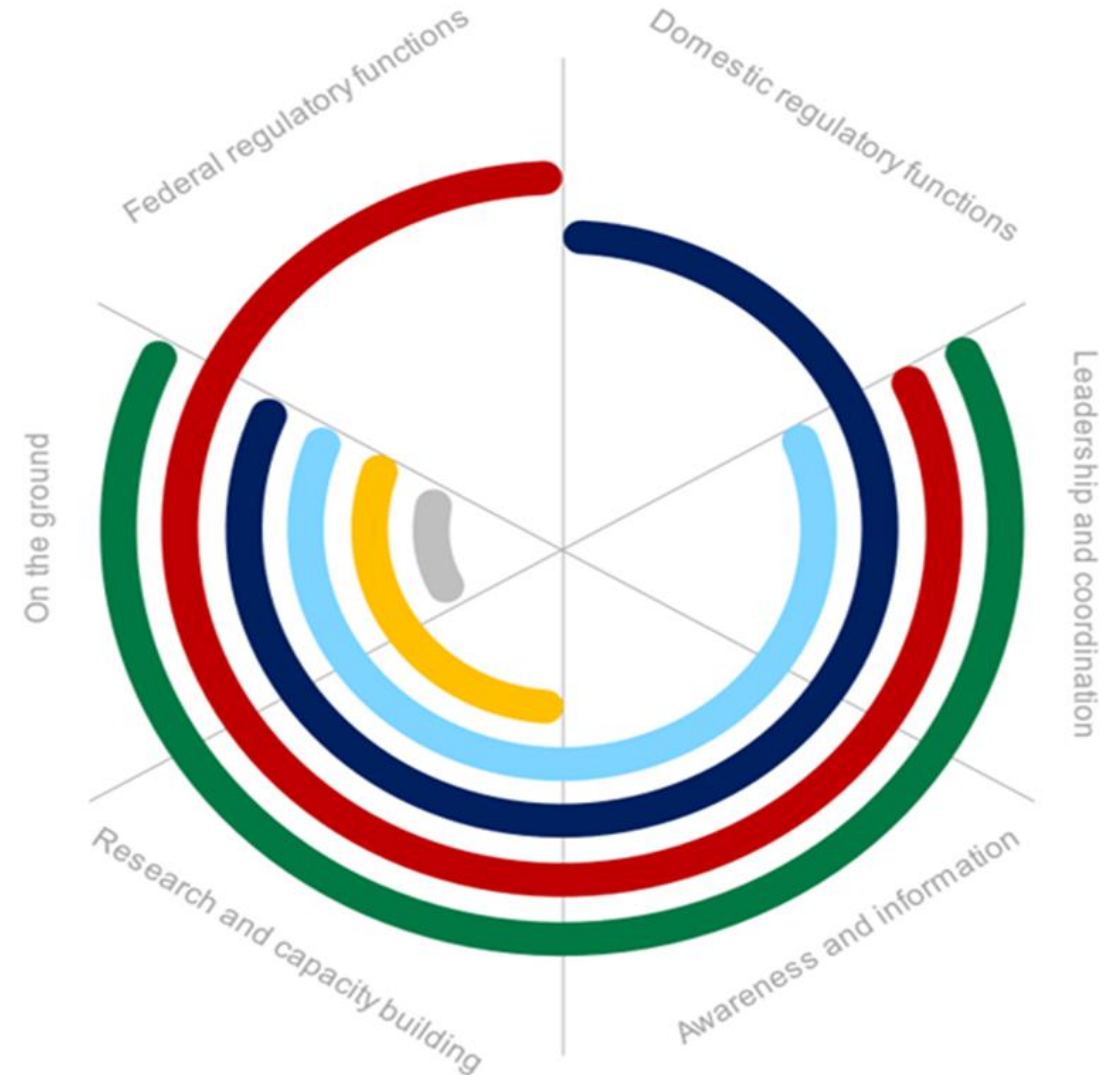
shared responsibilities

	INDUSTRY	STATES	COMMONWEALTH
Intra Paddock			
Inter paddock			
Properties			
Regions			
Jurisdictions			
Border			
Pre Border			

GRDC: Role in the biosecurity system

GRDC's role in biosecurity for the Australian Grains Industry

- 01 GRDC
- 02 Australian government
- 03 State and local government
- 04 Representative bodies
- 05 Research organisations
- 06 Individuals



GRDC Biosecurity Investments

Financial Year	Rural Research, Development and Extension Priorities Biosecurity column (as per annual report)
2021/22	\$34.7*
2020/21	\$30.9
2019/20	\$33.5
2018/19	\$39.9
2017/18	\$36.9
5 yr Total	\$175.9

Biosecurity Investments

Surveillance

Disease surveillance and related diagnostics for the Australian grains industry

- NSW, QLD, VIC, SA & WA
- Access to diagnostic capacity and advice for grain crop diseases in their state
- Random and targeted seasonal surveillance activities
- Evidence of area freedom data through exotic absence reporting

IPM for Grains, delivered by the National Pest Information Network

- Develop and deliver comprehensive pest identification and management information that provides an effective balance of the available control options (genetic, cultural, biological and chemical) that supports the integrated management of invertebrate pests.

iMaps Pests: Sentinel Surveillance for Agriculture

Biosecurity Investments

Diagnostics



Boosting Diagnostic Capacity for Plant Production Industries

- Grains, cotton, fruit and vegetables, wine and table grapes, forestry and sugar
- Develop new or revised and updated diagnostic tools for a range of exotic pests and diseases

National Grain Diagnostics & Surveillance Initiative (NGDSI)

- Announcement coming soon

Biosecurity Investments

Preparedness and Response



Review and develop new grain biosecurity contingency plans

Prevention and preparedness for fall armyworm

Current and potential costs of diseases and invertebrate pests in Australian grains

Updating exotic priority threat tables and the Grains Industry Biosecurity Plan

Australian Cereal Rust Control Program

Post border risk mapping for Khapra beetle

Fall Armyworm

Incursion Example – Transition to Management



Fall Armyworm

- Invasive pest that feeds on 350 + hosts
- Detected in Northern Australia in January 2020 and has now spread across most of Australia
- Able to fly long distances – up to 500km in lifetime
- Resistance to organophosphates, carbamates and others.
- Evidence of impact on grasses, maize, sorghum and a range of horticultural crops.
- Found very low levels of egg parasitism from *Trichogramma* released locations in QLD but NT showing positive results.
- Evidence of predation from:
 - Shield bugs
 - Earwigs
 - Assassin bugs

Fall Armyworm

Transition to management – GRDC Investments



Prevention and preparedness for fall armyworm (*Spodoptera frugiperda*) – (2020)

Podcast for Fall Armyworm management in northern farming systems (*Spodoptera frugiperda*) - (2020) Establish Australian economic management thresholds for fall armyworm in maize for (rainfed and irrigated) and sorghum – (2021)

Resistance surveillance for sustainable management of *Helicoverpa* and fall armyworm in grains (2023)

Effective fall armyworm pheromone blends for improved monitoring and population estimation in Australia (2022)

Multiple chemical permits and investments with other RDCs to look at a range of biological control options (2020)



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GRAINS RESEARCH
& DEVELOPMENT
CORPORATION

Thank you. Any Questions?

Callum Fletcher
Manager – Biosecurity

Callum.fletcher@grdc.com.au