

Australia's Current Agricultural Position

An Academy View

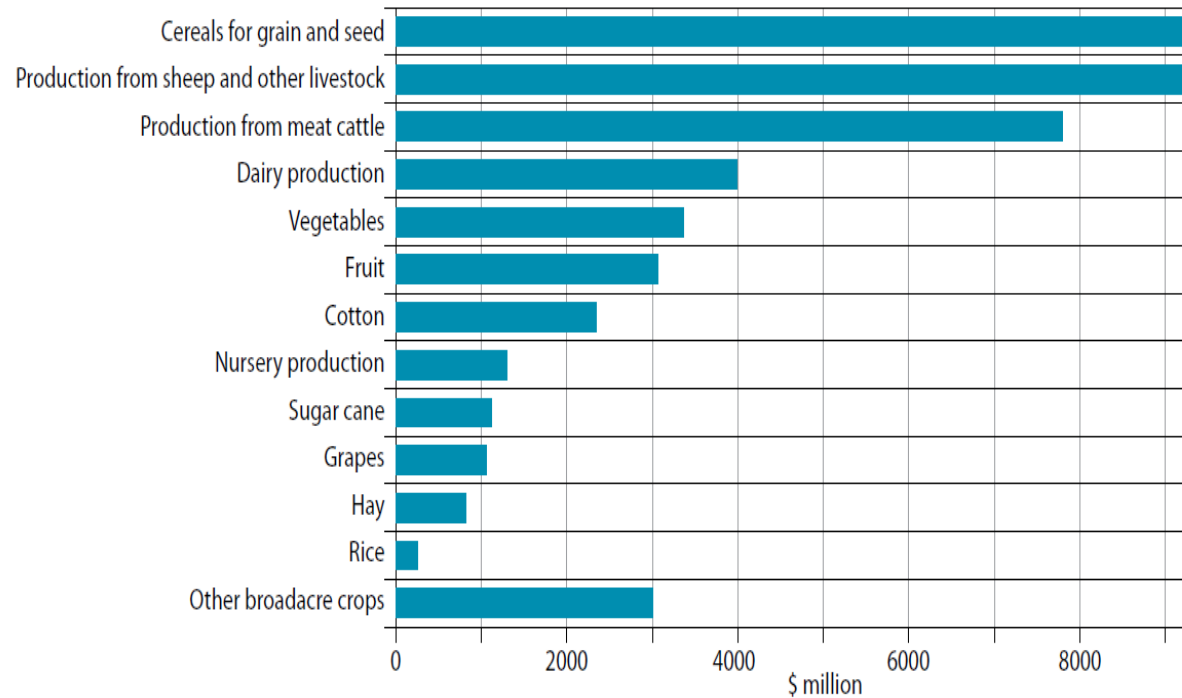


Professor Snow Barlow FTSE, FAIAST

University of Melbourne

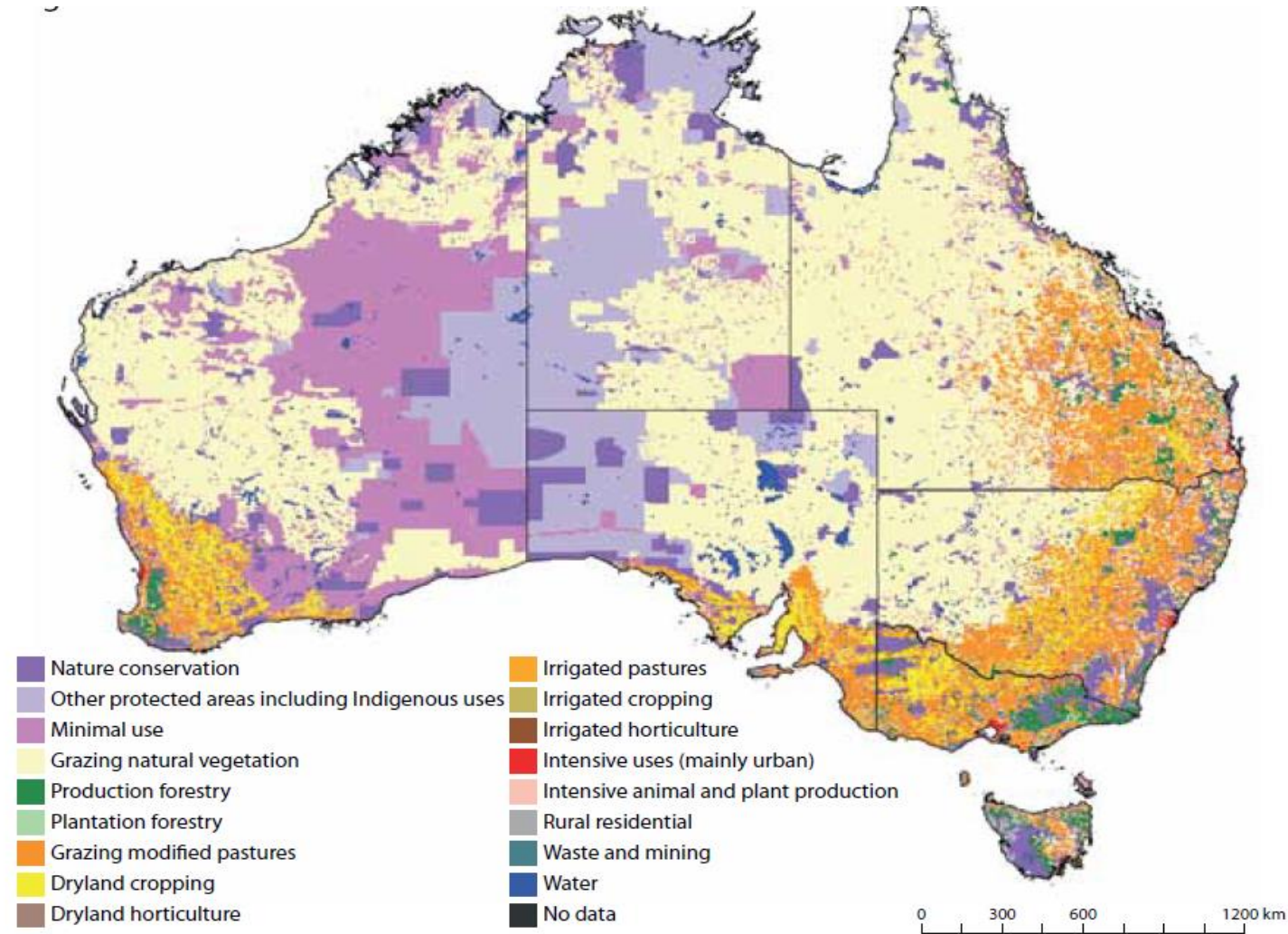
Australian Agricultural Production 2011-2012

- **Agricultural Production Value - \$60b (in a good year)**
- **Agrifood sector - \$200b**
- **Exports - \$40-45b**
- **80,000 farmers**

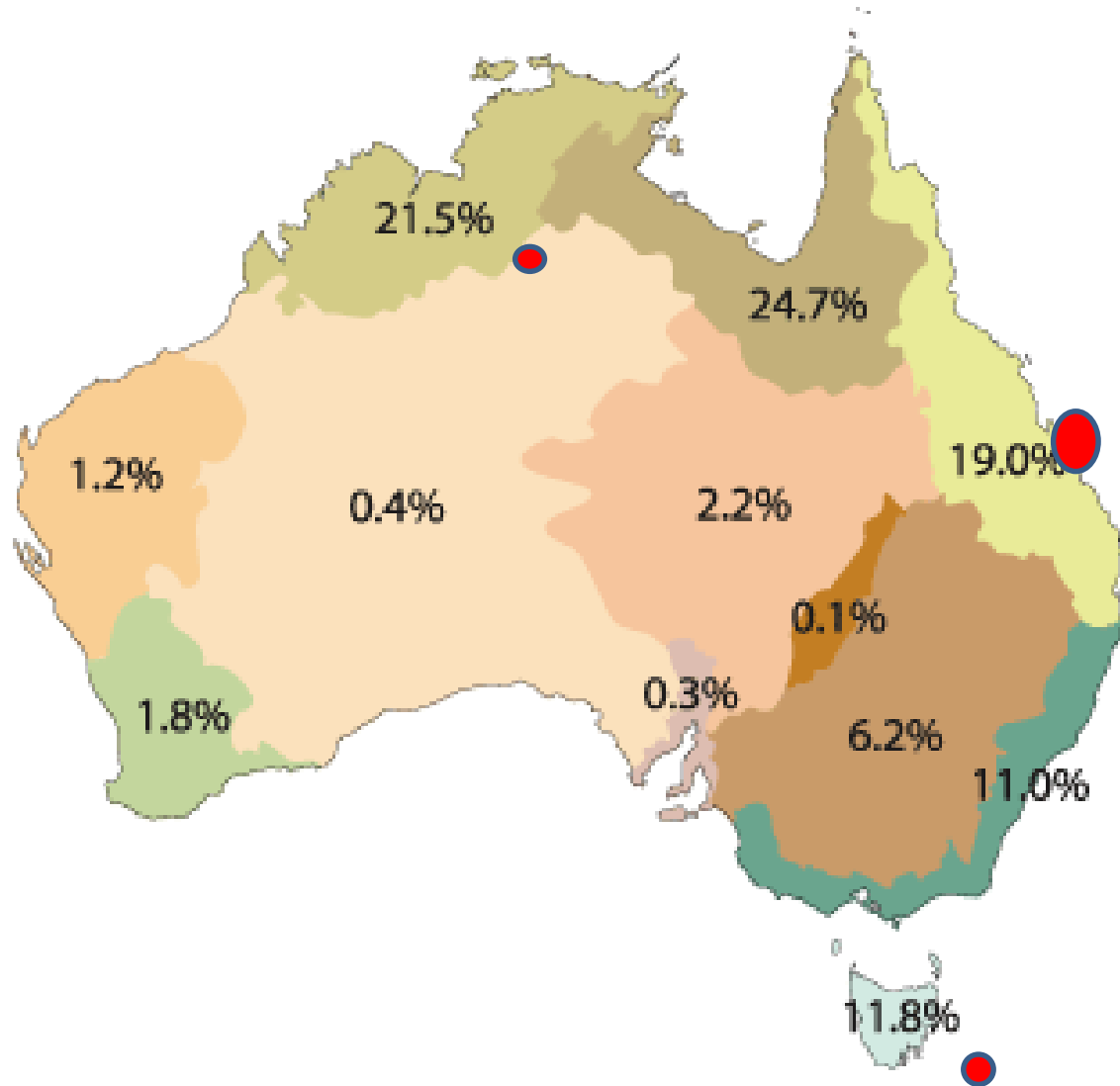


(ABS 2013)

What are our competitive advantages ?



Most of Australia's Fresh water is in Northern Australia



Distribution of Freshwater in Australia

- More than 70% in Northern Australia

- Murray Darling Basin is 6% of Australian fresh Water

- This is the most vulnerable area to climate change

Land and Water Use in Australian Agriculture

Land use by agricultural businesses (Mha)	
Area of Australia	769.2
Area of agricultural businesses	405.5
Area cropped	31.9
Area irrigated	2.1
Water use by agricultural businesses	
Volume of water applied	8174 GL
Average application rate	3.8 ML/ha
Total number of irrigation businesses	34,911
Total number of agricultural businesses	135,692

Australia is not dissimilar to the globe , some possibilities for further natural resource development , but major increases in production will have to come from existing land

Can Northern Australia Contribute ?



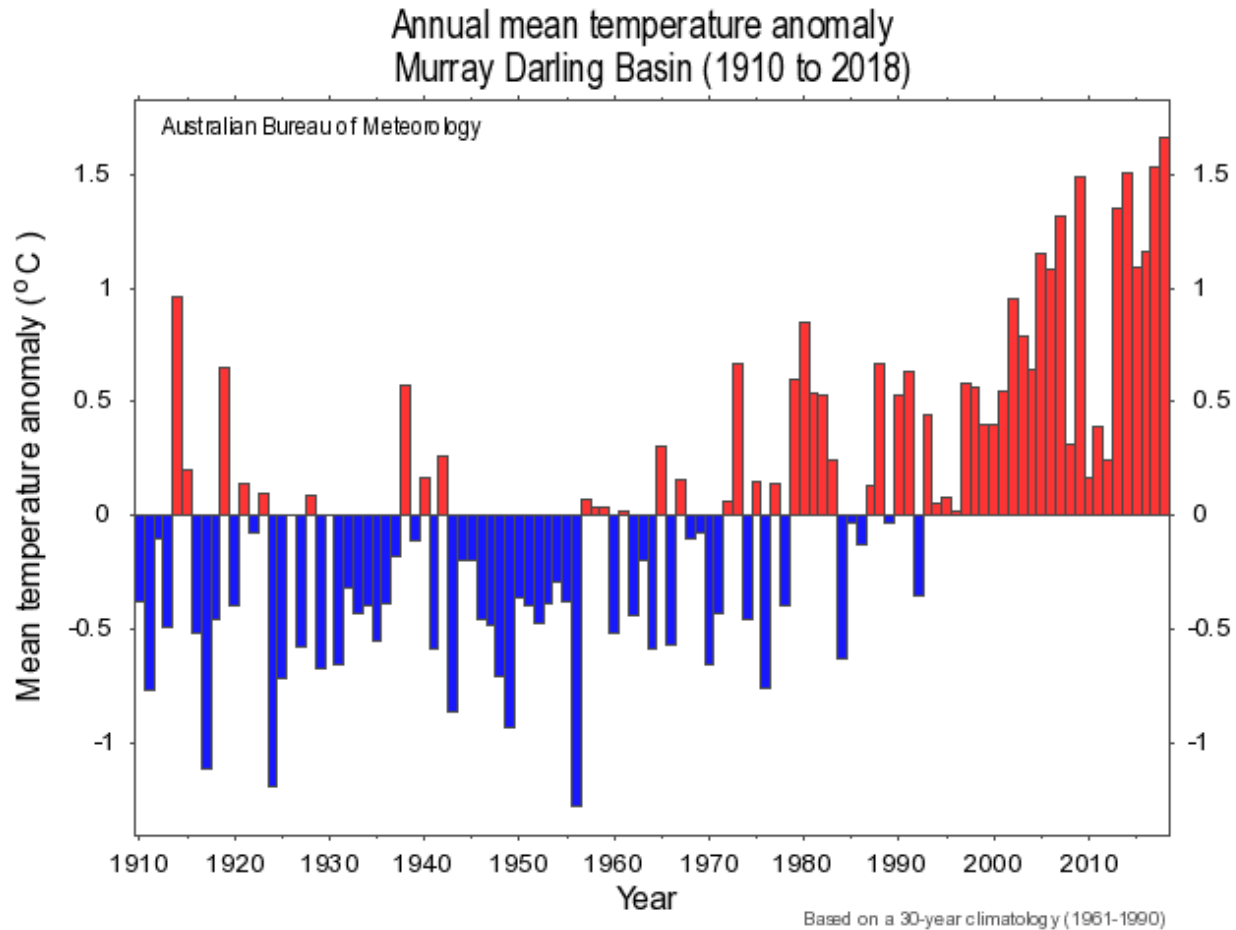
Northern Australia

- More than 50% of Australia's water resources
- 5-17 Million hectares(Mha) of arable land (currently we farm 25Mha)

But

- Large water storage difficult –evaporation very high
- Probably only 2Mha suitable for cropping
- Infrastructure sparse or non existent
- A Co-operative Research Centre for Northern Development formed

Australia's major food bowl - *Murray Darling Basin* *warming even faster*

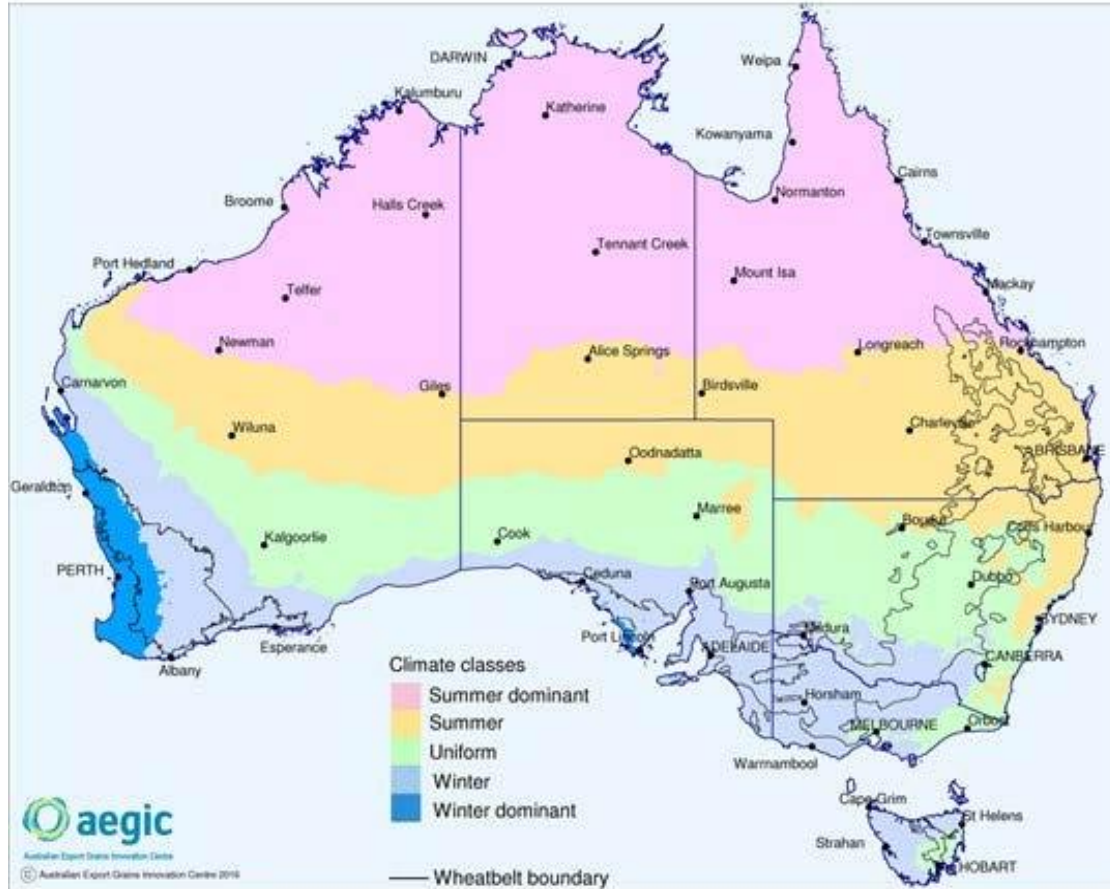


- **14% of Australia**
- **2 Million people**
- **60% of Australia's Food**
- **Tendency of industries to move south with climate change**

Climatic Patterns are changing

Australia Seasonal Rainfall Zones

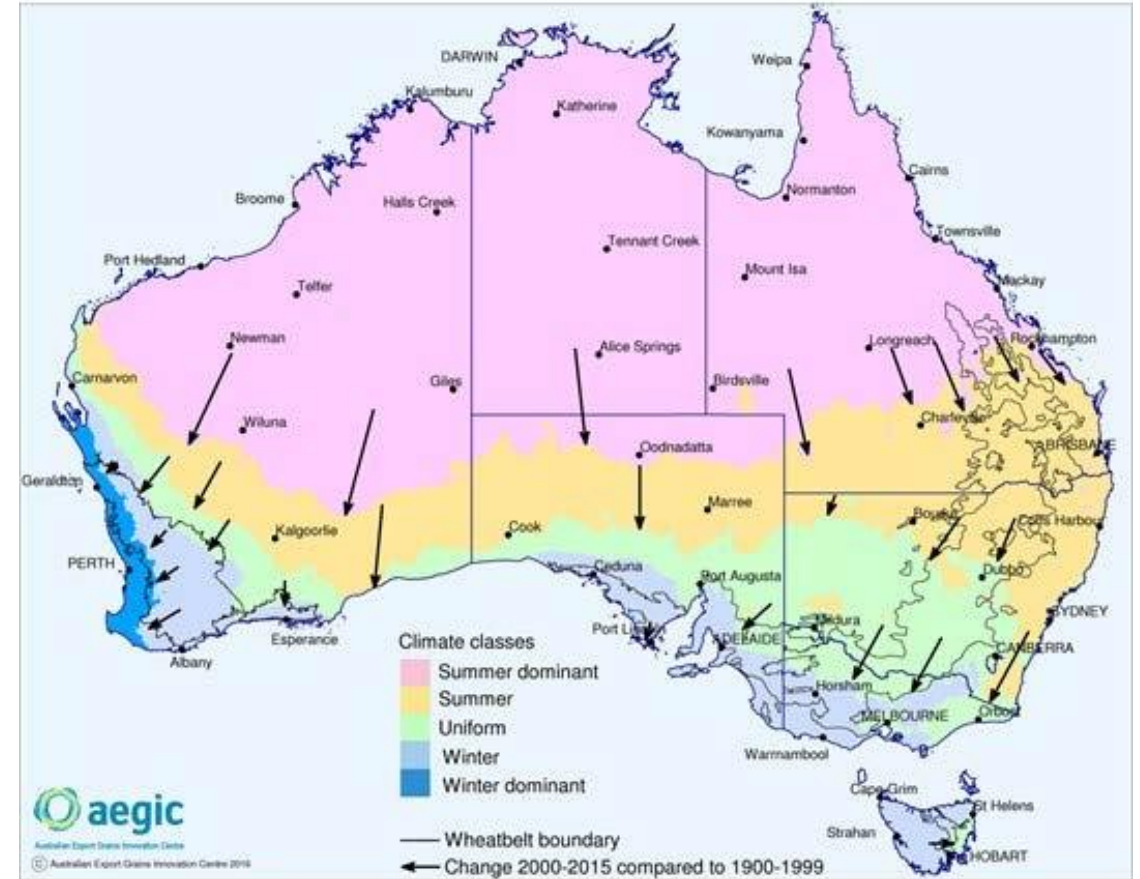
Based on rainfall data 1900-1999



1900-1999

Australia Seasonal Rainfall Zones

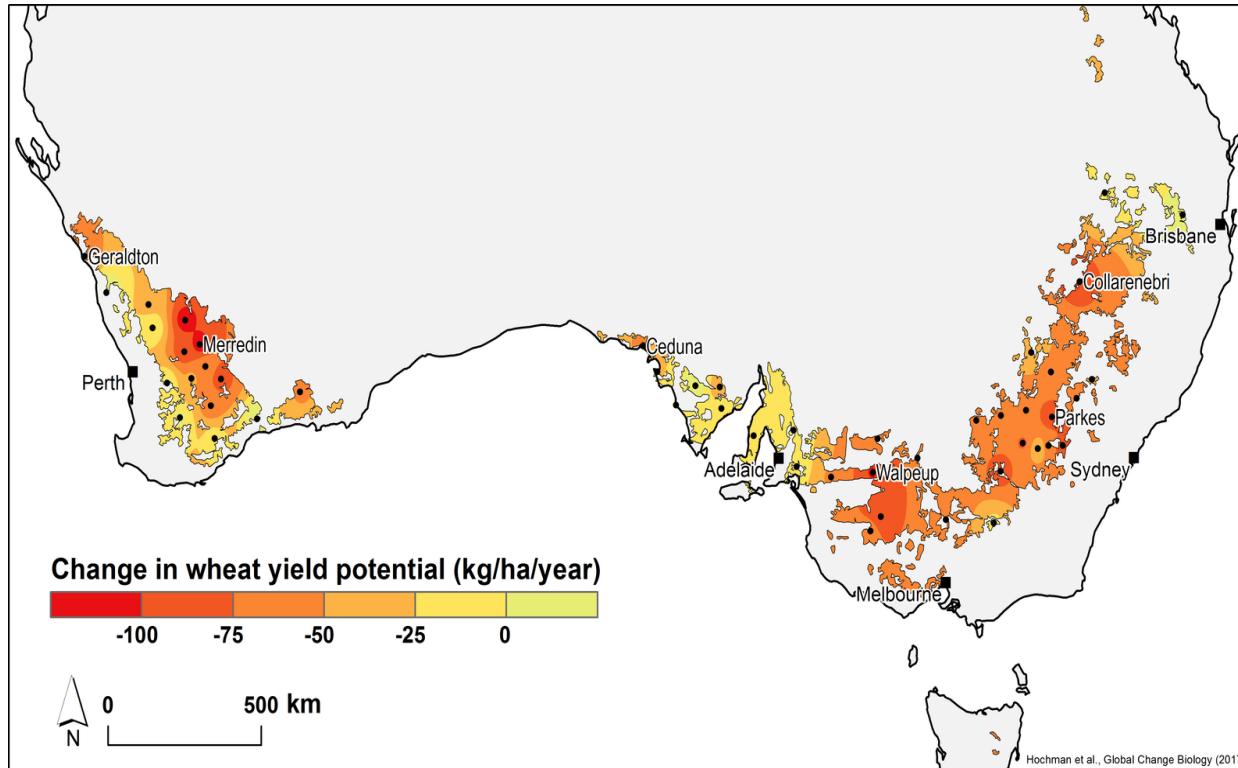
Based on rainfall data 2000-2015



2000-2015

Australian wheat yields have remained constant for past 25 years

But-Potential Wheat Yield decline from 4.4 to 3.2 tonnes per hectare since 1990



Yield Decline Due to:

Decreasing rainfall -83%
Increasing Temperature -17%
Increasing CO₂ + 4%

Climatic changes since 1990

- **28% decline in rainfall**
- **Max daily temp increase 1.05°C**

Actual yields constant due to farmer uptake of new technology

How long can technology compensate

Cotton Industry

- Less than 50 years old in Australia
- High tech industry
- Large investment
- Very profitable annual crop
- Have achieved large increases in water use technology through
 - Yield increases
 - Irrigation technology
- 50,000 ha in Southern MDB



Commercial cropping of cotton in Australia. Adapted from Cotton Australia sources.

Australia's Academies are very interested in food production and sustainability

Academies have a role in national policy and capacity building

- Academy of Technological Sciences and Engineering
 - *Food and Fibre –Australia's Opportunities*
- Australian Council of Learned Academies (ACOLA)
 - *Australia's Agricultural Future*
- Australian Academy of Sciences
 - *Grow, Make ,Prosper- a decadal plan for Australian Agriculture*
- Australian Council of Learned Academies (ACOLA)
 - Next Generation Agricultural Technologies (in progress)

Major Conclusions

1. Australia's agricultural sector has a bright future with continuing comparative advantage in export :
 - bulk commodities
 - high-value products
2. Australia's reputation for 'safe, clean and green' food is a major comparative advantage
3. The sector must efficiently manage its soil and water resources in the face of climate change
4. The sector needs to attract capital and skilled labour
5. Accelerate uptake of advanced technologies, communications and knowledge systems
6. Ongoing investment in research and development, both private and public, is vital
7. A range of community concerns with regulatory, social and political implications important to agriculture's future

Emergent themes relating to agroecology

All organisations in the agricultural sector do more to understand and effectively engage with the public on social acceptance of agricultural science and the enterprises it supports. This also applies to understanding that agriculture reaches far beyond the farm gate.

Social movement in Australia in Regenerative Agriculture

Food has been elevated within the current generation (millennials)

Return to the constructive use of Australian agricultural and natural resource expertise as a foreign affairs policy