

## **Inquiry into the impact of climate change on Queensland agricultural production**

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Dear Committee Secretary,

**Reference: Inquiry into the impact of climate change on Queensland agricultural production.**

Thank you for your invitation to provide feedback on the impact of climate change on Queensland agricultural production, received via email on 18 August 2023 and the opportunity to participate in the Climate Roundtable on 22 March 2023. I am responding on behalf of AgriFutures Australia, a statutory Research & Development Corporation responsible for levied industries (13), non-levied industries (plant, animal & aquatic) and cross-sector rural issues. Further details are available on our company website available at: -<https://www.agrifutures.com.au/>.

AgriFutures is responsible for:

- Investing in RD&E which aims to drive the growth and development of emerging, high-potential agricultural rural industries such as coffee, sesame, industrial hemp and seaweed.
- Developing and delivering programs that respond to the specific workforce and leadership needs of those working in the Australian agricultural sector.
- Delivering programs that future-proof Australian rural industries by identifying and responding to national challenges and opportunities which impact the Australian agricultural sector.
- Engaging with the global agrifood innovation system to ensure Australia is a leader in accessing, adopting, developing and exporting agrifood technologies and innovation.

AgriFutures is a 'future-thinking' organisation and aims to tackle the rural challenges and opportunities we face today and unearth the challenges and opportunities of tomorrow. We commend this inquiry by the State Development and Regional Industries Committee given the importance of identifying and addressing the impact of climate change on Queensland agricultural production in the future.

Given the breadth of plant and animal agricultural industries produced in Queensland, I can provide further details from a general agricultural perspective. There is alignment to some specific industries in our research that is primarily produced in tropical and sub-tropical climates and environments, for example ginger, coffee and sesame. It also addresses general areas around biosecurity, water security and pests, disease and weed management.

Our response is guided by the terms of reference for the inquiry.

- a) the impacts of climate change and climate variability on Queensland agricultural production and the existing and potential future risks of climate change on the sector.

#### The challenges climate change poses to Queensland farmers

- The **impact** of climate change outscores the **uncertainty**.
  - **Water** availability, water security, water infrastructure and water storage.
  - Availability of **arable land** due to impacts of changing nutrition, drought and erosion. Decrease in ability to maintain and/or regenerate land for agriculture or prevent soil loss.
  - **Biosecurity**: changes to rainfall/weather patterns changes that may increase pest and disease burden. The potential for new and exotic pests, e.g. recent incursion of fall armyworm, and Guava root knot nematode, that could be indirectly attributed to climate change. Changes to the geographic zone and environments for biosecurity impacts. For example, in the ginger industry the impact of more rain and higher temperatures would result in plant parasites like pythium species becoming more prevalent.
  - **Temperature extremes** are problematic for rice with especially sensitive points in the growing season (e.g. panicle initiation is significantly impacted by low temperatures). Although rice is a small and opportunistic crop in Queensland, temperature extremes could affect other field crops.
  - Efficient and economic **weed and pest management** due to climate change. We are already seeing Queensland faced with these challenges, especially in the north around weed management in the current environment. Should the temperature and rainfall look to increase as well, the ability to manage weeds effectively will continue to impact producers' ability to provide premium products to supplement the supply gap during non-peak periods across the country for production. This is an ongoing challenge for producers, and a cost-effective solution is yet to be proven.
  - Variability in the '**wet season**'. Northern Queensland relies heavily on the wet season to prepare them for the prolonged months with no rain. Should rainfall events become more infrequent, producers are faced with challenges around keeping their crops/livestock alive by purchasing additional water (where it is easily accessible). In Tea Tree for example, the current cost to irrigate tree crops over a summer in hope they will get a harvest the following year is excessive. Specifically, when supply from overseas markets affects the demand locally.
  - Improved management of resources required for biosecurity (surveillance, diagnostics and response management).
  - Damage to all types of infrastructure required to support rural areas and agricultural activities.
- b) opportunities for the Queensland Government to create and support resilience, adaptation and mitigation measures in preparing the agricultural sector for future climate change.

Existing policies and programs to support adaptation and resilience.

- Technology grant programs at state and federal level can provide for equipment and importantly set-up and training in the use of technology, e.g. smart sensors and water monitors.  
The AgriFutures Producer Technology Uptake Program (PTUP), which has a number of programs in Queensland, doesn't specifically target climate change adaptation or resilience. However, indirectly it has impacted via the engagement of producers engaged with agritech to improve production efficiency, better manage inputs, improve land management for business resilience and environmental stewardship.
- Support for new enterprise mix where the agricultural sector will be investigating alternative enterprises or alternate revenue streams that utilize natural resources, for example carbon farming, agrivoltaics, renewable energy. This may be supported with access to advisory services, knowledge hubs, international networks, land use development and planning policy.
- Support for industries shifting the geographic location or season of production for their enterprise, for example the cotton industry in the Emerald district shifted the calendar for operations to avoid seasonal rains at key production times based on rainfall patterns.

### Ways in which policy makers can better support the state's farmers to adjust to a changing climate.

- Responding to key uncertainties or drivers of climate change to Year 2040.
- **Scenario 1: Limited shift** in Australian climate – increase in frequency and severity of extreme weather events; agribusiness under manageable pressure.
- **Scenario 2: Strong shift** in Australia climate – extremely wet in north; stronger increase in frequency and severity of extreme weather events; redistribution of pests and diseases.
- Continued and increased focus on biosecurity and how climate changes the impacts from different pests and diseases.
- Provide support programs to help farmers adjust. The Community of Practice approach with climate and seasonal forecasts has been well received.
- Innovative sources of investment to develop biosecurity programs, including new revenue streams for border surveillance.
- Co-ordinated biotechnology investment to increase adoption and use.

### Research & development

In reviewing, collating and summarising its findings, the committee could also use existing resources that are available, to not repeat investments in projects, and leverage existing and past investments.

#### Improved use of seasonal forecasting to increase farmer profitability.

This research was conducted 2015-2018 and focused on improving the accuracy of the climate forecasting models generated by the Bureau of Meteorology (BoM). Although most farmers are aware of climate risk, there is variability in the adoption of Seasonal Climate Forecasts to manage that risk. A full report is available at:- [Improved use of seasonal forecasting to increase farmer profitability | AgriFutures Australia](#).

### Forewarned is Forearmed

AgriFutures contributed to this Commonwealth funded program 'Forewarned is Forearmed (FWFA)' led by Meat & Livestock Australia (2017-23).

Key insights from the program included:-

- Australian farmers and agribusiness operate in one of the most variable climates of any country in the world, with extreme events and climate variability the largest drivers of fluctuations in annual agricultural production and income.
- FWFA is about equipping farmers and agricultural value chains to proactively manage the impacts of extreme climate events and provided five new BoM forecast products for extreme events in forecast periods of weeks to months.
- All new forecast products of extreme events have now been listed on the Bureau's website. See <http://www.bom.gov.au/climate/outlooks/#/rainfall/extremes/p80>.

### Which Plant Where?

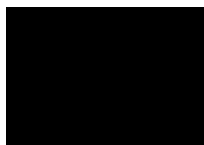
Another interesting approach on assessing the impact of climate changes was conducted by the nursery industry within Horticulture Innovation Australia in the project "Which Plant Where?"

Which Plant Where is a culmination of 5 years of research investigating which horticultural species will survive in Australian urban landscapes, not only now but under future climates. This plant selection tool is underpinned by the latest scientific evidence, providing growers, nurseries, landscape architects and urban greening professionals with integrated tools and resources to develop resilient and sustainable urban green spaces for the future. Link - [www.whichplantwhere.com.au](http://www.whichplantwhere.com.au).

I am available to discuss further details by phone [REDACTED] or email –

[REDACTED].

Yours sincerely



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Cc: J. Harvey, Managing Director