

# Cropping Brief- International Supply Chain Benchmarking Sectoral Assessment

Report for the Department of Infrastructure, Transport, Regional Development and Communications

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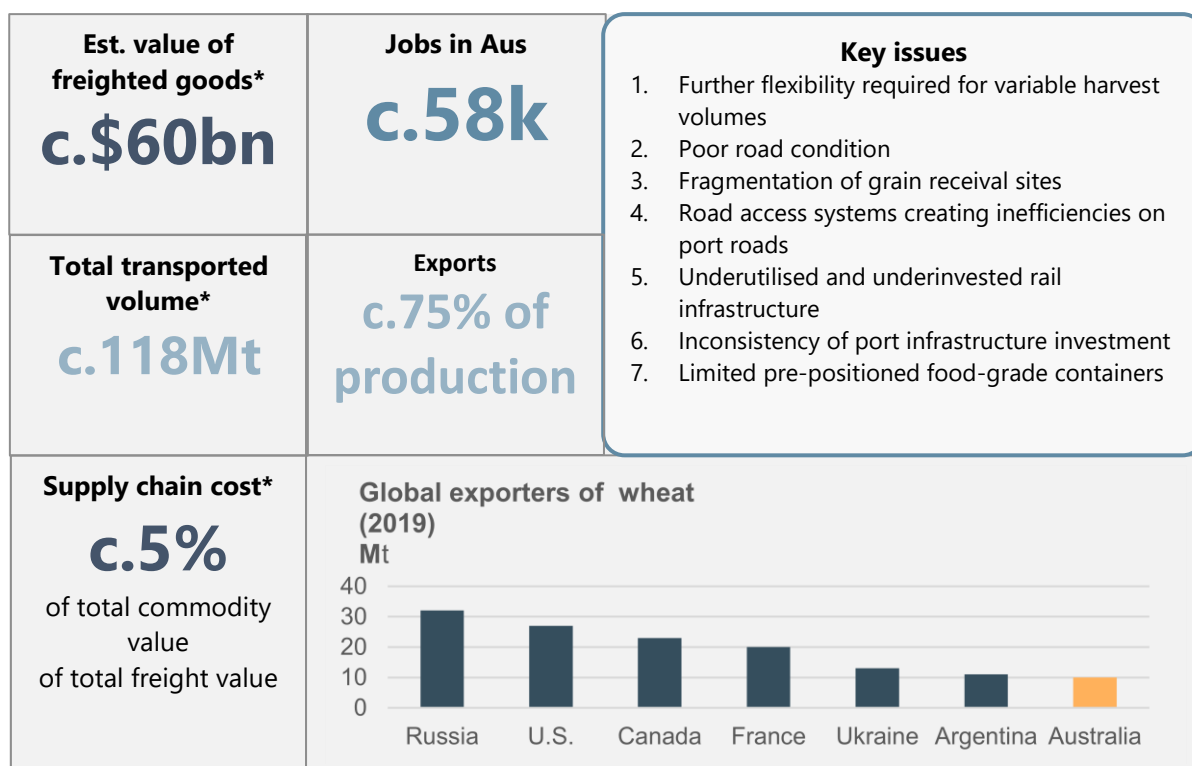
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## Executive Summary



\* Volume and value include wheat, barley, cottonseed, rice, sugar and other crops

Cropping supply chains are complex and important for Australia. They account for a significant volume of exports and the industry employs a high number of people (c.58k). The relevant supply chains include a range of crops, such as grains including wheat, barley, cottonseed, rice and other crops and sugar. A significant proportion (>75%) of these crops are exported.

One of the key findings in the prior L.E.K. [report](#) on the grain supply chain was that one of the largest issues for the cropping supply chain is that crop harvest volumes are subject to severe changes in climate, particularly drought. This yield variability makes it difficult to ensure a consistent return on investment for supply chain infrastructure. Crop prices can fluctuate substantially with the variability of supply.

Countries with efficient supply chains, such as Canada, have invested in upcountry receival to ensure significant storage capacity and use high-capacity train units to move crops to port efficiently. In addition, they have invested in large scale, high throughput port terminal infrastructure concentrated at a small number of ports to ensure high asset utilisation and a simplified supply chain. Ultimately, a low cost, efficient supply chain allows a country to withstand price and volume variability.

## Cropping Supply Chains in Australia

Cropping supply chains include the growth and transport of grains (including wheat, barley, rice and cottonseed) and sugar. These commodities are grown on a farm before being transported to a receival site for aggregation. The crops are then moved to domestic uses (such as mills/refineries) or to port either by train or truck, in intermodal containers or in bulk and then shipped overseas.

The grain sector employs over c.35,000 people in Australia. Western Australia is the largest producer of wheat, with c.32% of Australia's average harvest. Australia exports 75% of all wheat, over 90% of all cotton and 70% of all barley produced.



In 2019 Australia exported c.80% of all sugar produced, making it the third largest sugar exporter.<sup>i</sup> The sugar industry employs c.23,000 people. Sugar production is heavily concentrated in Queensland (95%) with 5% in NSW. Queensland has one of the largest sugar storage and handling systems in the world, with capacity of over two million tonnes of raw sugar.<sup>ii</sup>

Australia's cropping supply chain faces the following key issues:

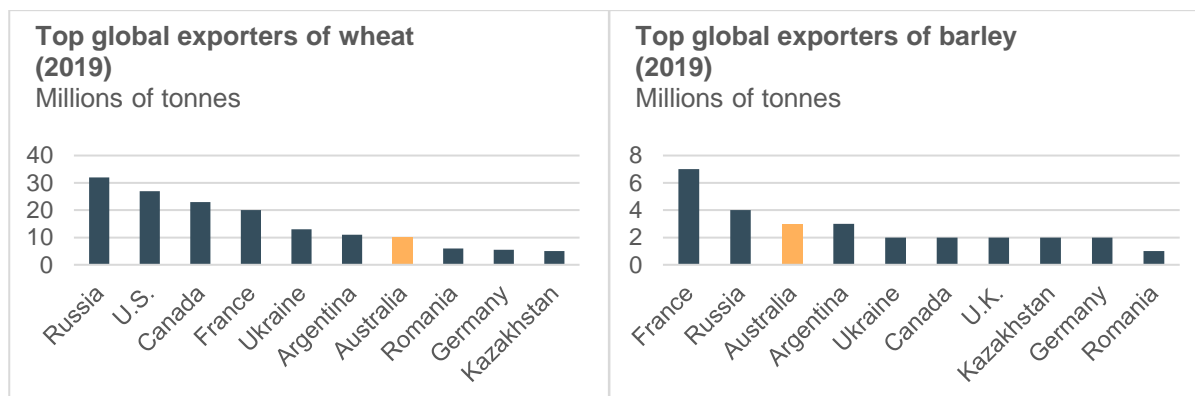
1. The chief issue in the Australian cropping supply chain, is building the requisite flexibility to appropriately scale up and scale down for high and low years. This issue exists at both a national and regional level, based on regional level seasonality.
2. Access to local roads is limited due to poor road conditions, and load capacities are often not fit for purpose limiting access for heavy vehicles.
3. The network of grain receival sites is fragmented, with many small, low capacity and inefficient sites that drive up operational costs.
4. Road transport to port is hindered by permit processes on some roads and an uncertain supply of road transport. Consecutive poor harvests have resulted in a lack of drivers and road freight companies which may drive up the cost of road freight in strong harvest years.
5. Many rail lines are underutilised, and not shared with other products. Low returns have discouraged investment in and maintenance of rail, creating issues such as ageing tracks, rolling stock, and signalling systems, gauge mismatches, axle load limits, low capacity, speed limits and poor reliability.
6. There has been inconsistency of investment in port infrastructure. Overinvestment in port infrastructure in some regions has created excess capacity (outside of bumper seasons), driving low utilisation and return on investment. However, other ports have insufficient throughput capacity and experience congestion.
7. There is difficulty in pre-positioning food grade containers due to constrained supply. Minor container ports have limited capacity.

Commodity prices are a key threat for the cropping sector and are subject to demand and available supply. This can put pressures on margins, favouring low-cost producers that can withstand low prices. While demand for crops is generally related to global population and food consumption, trends in consumer behaviour can impact the demand and price of crops.

## International Supply Chain Comparison

Many crops are seasonal and require a particular climate to thrive. For example, grain is usually ready for export in the summer and grows best when temperatures are warm. Similarly, sugar cane is a tropical plant that can only be grown in countries with high temperatures. This provides a natural counter-cyclicality to exports from the northern and southern hemisphere. However, this means that market participants need to move bulk tonnages quickly, within their seasonal window before grain becomes available from exporters in the alternate hemisphere.

Crops can vary widely in terms of annual production volumes. Yields can be heavily reliant on weather and drought or other extreme temperature conditions can lead to lower harvests. The volatility of production can negatively impact the return on critical supply chain infrastructure such as port and railway infrastructure which may be underutilised for drought years. Alternatively, there may not be sufficient infrastructure to cope with particularly strong years. Climate change is anticipated to have a long-term impact on crop yields, as temperatures rise and impact the ability to grow crops in particular region.



Australia is in the top 10 largest global producers and exporters of significant grains such as wheat and barley, with most major players in North America and Europe.<sup>iii</sup>

2019 (Mt)	Australia	Ukraine	Canada
Wheat produced	c.18Mt	c.28Mt	c.32Mt

2019 (Mt)	Australia	Russia	France	Germany	Canada	Ukraine
Barley produced	c.9Mt	c.20Mt	c.14Mt	c.12Mt	c.10Mt	c.9Mt

2019 (Mt)	Australia	China	India	U.S.	Brazil	Pakistan
Cottonseed produced	c.1.6Mt	c.23Mt	c.19Mt	c.13Mt	c.7Mt	c.4.5Mt

2019 (Mt)	Australia	India	Brazil	Thailand	U.S.
Sugar produced	c.4Mt	c.30Mt	c.29Mt	c.14Mt	c.7Mt

## Benchmarking considerations

Intl. benchmarking considerations	Importance	Cropping supply chain
Size and growth	🟡	The cropping supply chain employs c.58k Australians and moves significant volume each year
Freight importance	🟡	Freight is a sizable proportion of the cost to the cropping industry. Improving freight performance will have a reasonable impact on the industry
Export importance	🟡	A substantial portion of crops are exported. Improving freight performance could make Australia more competitive globally
Geographic scope	🟡	Cropping is important to the largest states (WA, NSW, SA, QLD, VIC) due to the diversity of crops
Known efficiency / public interest	🟡	The complexity and harvest related issues within the supply chain are well known and generally well-studied

L.E.K's findings from the phase 2 grain study highlighted a number of areas of the wheat supply chain that could be improved, such as on-farm storage, road transport (to up country receival and to port), upcountry receival, rail transport to port, domestic ports and containerisation. The quantum of findings, coupled with the high cost of transport inherent in grain production, suggest that the supply chain could be substantially improved to make Australia's exports more competitive.

While wheat has been well studied historically, further investigation into other grains or sugar could be beneficial. The CSIRO transit tool shows that wheat makes up the majority of total cropping freight task costs (c.50%). Barley, cotton and sugar make up c.33% of the total cropping freight task costs, suggesting that they would be particularly suitable for further investigation. There is an opportunity to undertake further international benchmarking against these cropping supply chains. In particular, sugar could be benchmarked against Brazil or the U.S., which both have areas with similarly tropical climates to Australia

## References

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<sup>i</sup>Queensland Transport and Logistics Council, Supply Chain Perspective Sugar, 2013; Food and Agricultural Organization of the United Nations Statistics, Top 10 countries by commodity, 2019

<sup>ii</sup> Queensland Transport and Logistics Council, Supply Chain Perspective Sugar, 2013

<sup>iii</sup> Food and Agricultural Organization of the United Nations Statistics, Top 10 countries by commodity, 2019