GRAINS AUSTRALIA

The Economic Impacts of Non-Tariff Measures on Australian Grain Exports

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Prepared in collaboration with the Australian National University

Grains Australia is an initiative of the GRDC Grains Research & Development Corporation

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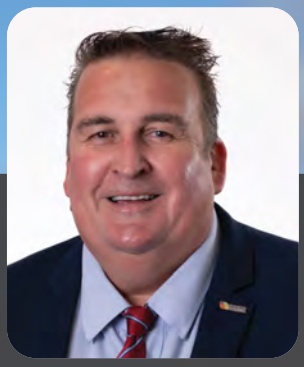
The Economic Impacts of Non-Tariff Measures on Australian Grain Exports.

Grains Australia is an initiative of the Grains Research and Development Corporation (GRDC). GRDC leads investment in grains research, development and extension (RD&E) in Australia to create enduring profitability for grain growers.

In the spirit of reconciliation, Grains Australia acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respects to their Elders past, present and emerging, and extend that respect to all Aboriginal and Torres Strait Islander peoples today.



FOREWORD

The expansion of Non-Tariff Measures (NTMs) is a major challenge for Australian grain exporters. Evidence suggests that NTMs have surpassed tariffs to become the biggest single barrier to international market access, costing the industry billions of dollars each year.

A key function of Grains Australia is to help the industry maintain and expand access to diverse international markets and strategically respond to trade impediments. We believe that addressing the challenges of NTMs is increasingly urgent.

This is an inherently complex problem. While some NTMs are political in nature, others arise from scientific, biosecurity or public health considerations. This complexity is further compounded by the fact that NTMs are often country and product-specific, with different impacts across grain types and export markets.

Effective engagement with trading partners regarding NTMs requires not only sustained effort and skilled diplomacy, but also robust, credible and compelling evidence. To negotiate effectively, the Australian industry needs a clear and detailed understanding of the NTM landscape.

This report equips the Australian grains industry with the insights and data needed to address the issue of NTMs.

This study was undertaken by a research team led by Professor Yu Sheng, Crawford Chair of Agricultural Economics. I extend my sincere thanks to Professor Sheng and his colleagues for compiling this report and the significant body of evidence that underpins it.

Richard Simonaitis

CEO, Grains Australia

February 2026

INTRODUCTION

The shift from tariffs to technical barriers

While Free Trade Agreements (FTAs) have been highly effective in reducing border taxes, they have been replaced by a rising tide of NTMs. As traditional trade barriers fall, new and often complex regulatory hurdles are taking their place, creating increased risk and uncertainty for Australian exporters.

There are more than 200 individual NTM classifications globally. This study groups them into three major categories:

- Technical barriers to trade (TBTs).
- Sanitary and phytosanitary (SPS) measures.
- Maximum residue limits (MRLs).

The report estimates the impacts of these NTM categories on wheat, barley, pulses, oilseeds, sorghum and other grain products. It also assesses the potential benefits of reducing NTMs, and offers insights to help inform Australia's approach to international trade negotiations.

The opportunity: turning compliance into competitive advantage

Not all NTMs are created equal. While many add unnecessary costs, others serve as a "seal of approval." Australia's world-class safety and quality standards allow us to meet strict requirements that our competitors cannot.

The research identifies that reducing trade-distorting measures could provide mutual benefits for Australian exporters and regional partners. Major ASEAN importers could realise lower costs and enhanced supply security, strengthening regional trade relationships.

- **The goal:** The industry could further distinguish between 'strategic' rules that signal quality and 'inefficient' rules that are merely duplicative or costly.
- **The value:** This approach would allow us to leverage our current high-bar standards as a strategic competitive advantage and a 'seal of approval' rather than just a compliance cost.

Our approach: targeted reform and technical engagement

Australia could consider prioritising the removal of NTMs that provide no demonstrated value. This would require a two-pronged approach:

- **Increased engagement:** Collaborating with government to streamline administrative requirements would enhance operational efficiency.
- **Strategic retention:** Supporting measures that protect our market share and validate our premium standing in the global market.

KEY FINDINGS

Existing NTMs:

- Are equivalent to an average ad valorem tariff of **20.4%** on Australian grains - around four times the **4.7%** average tariff rate applied by Australia's top ten grain-importing destinations.
- Result in an estimated **A$4.6 billion** in forgone export revenue for the grain industry each year.

NTMs have:

- Negative impacts on wheat (**22.3%**), barley (**4.9%**), oilseeds (**21.0%**) and pulses (**0.04%**).
- Current NTMs on sorghum and oats (**–2.1%** and **–0.3%**) analysed in this study were found to facilitate trade and favour Australian exports.

Different types of NTMs have diverse effects:

- TBTs and MRLs generate effects equivalent to tariffs of **20.3%** and **71.5%**, respectively, on Australian grain exports.
- Australian standards act as a 'quality signal.' While global measures typically restrict trade, Australia's provide a **19.0%** quality premium (vs **9.9%** globally), offering a comparative advantage based on safety and reliability.

A simulated substantial reduction in NTMs impact has the potential to:

- significantly increase Australian grain production and exports
- increase real GDP
- improve national welfare
- create additional jobs across the grains supply chain.

STRATEGIC RECOMMENDATIONS

Potential actions for industry and government consideration.

Prioritise reductions in inefficient, costly, duplicative NTMs

Australia could consider prioritising the removal of NTMs that provide no demonstrated value. This would require a two-pronged approach focusing on regulatory barriers that offer the largest economic dividends and are practical to address. This effort could be complemented by utilising Australia's existing compliance and quality assurance systems to strengthen market positioning and maintain a competitive advantage.

Foster enhanced industry representation

Regular technical advisory channels would allow for greater alignment between rulemakers and the sector. This collaborative approach would help ensure that emerging international standards are practical, flexible, and grounded in science.

Strengthen international negotiations through market-specific strategies

Diplomatic and technical efforts could concentrate on key growth markets. Moving toward market-specific, tailored engagement would ensure that bilateral interests and local production nuances are respected.

Continuous improvement of domestic systems

Australia could consider prioritising at-home regulatory improvements to ensure they remain feasible and reflect the daily realities of the grains industry. A commitment to streamlining current paperwork and compliance hurdles would help the sector adapt to global rules while avoiding unnecessary new costs and remaining competitive against markets pursuing their own domestic reforms and improvements.

FOCUSING ON AUSTRALIA'S GRAIN PRODUCTS

This study focuses on Australia's grain industry, comprising wheat, barley, sorghum, oats, pulses, oilseeds such as canola, and other key crops. It quantifies the economic impacts of NTMs on grain exports and domestic production, along with the associated effects across upstream and downstream industries and the broader macroeconomy.

The analysis was undertaken in two stages:

- **Direct impacts on exports**

  Existing NTMs were first assessed in terms of their effects on Australian grain exports. Because impact of NTMs cannot be assessed directly in quantitative models, recorded NTM incidents were converted into ad valorem equivalents (AVEs). These AVEs acted as tariff-like measures that enable estimation of trade impacts. AVEs also known as tariff equivalents (TEs), are used interchangeably throughout this report.

- **Broader economic impacts**

  In the second stage, these TEs estimates were applied to evaluate the wider economic consequences. This included changes in domestic grain output, value added in upstream industries (such as production inputs) and downstream industries (including processing and wholesale), as well as impacts on key macroeconomic indicators including GDP, welfare (measured as consumer and producer surplus) and employment.

The study concluded by presenting policy insights to support Australia's engagement in international trade negotiations for grain markets.

1 *Fell and Duver (2024b)*
2 *DAFF (2024)*

Understanding NTMs

NTMs also referred to as non-tariff barriers (NTBs) or technical market access (TMA) restrictions, encompass government policies other than tariffs or tariff-rate quotas that may influence trade. The Department of Foreign Affairs and Trade (DFAT)[2] defines NTBs as non-tariff initiatives that unjustifiably restrict trade. Consistent with recent Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)[1] research, this study adopts the broader term NTMs to include both justifiable and unjustifiable measures.

NTMs take several forms, including quantity restrictions or quotas, and a range of technical regulations such as SPS measures, TBTs and MRLs.

Building on the ABARES[1] analysis, which examined SPS and TBT measures, this study extends the analysis to include MRLs, recognising that SPS, TBTs and MRLs collectively represent the most significant non-tariff measures influencing Australia's grain exports.

NTMs included in the Study

SPS measures

These relate to the management of risks associated with pests, diseases and contaminants.

- **Sanitary measures** protect human and animal health, including requirements that reject contaminated grain shipments to prevent foodborne illnesses.
- **Phytosanitary measures** protect plant health, such as limits on pesticide residues or restrictions designed to prevent the introduction of invasive pests.

TBTs

These include regulations and standards associated with biosecurity, food safety, testing, labelling and certification requirements.

MRLs

These define permissible levels of pesticide or chemical residues in food and agricultural products.

- MRLs support food safety objectives by ensuring residues from agricultural chemicals remain within scientifically established thresholds.
- Non-compliance can lead to import restrictions or rejection of consignments, reinforcing the importance of adherence for maintaining market access.

3 *Fell and Duver (2024a)*
4 *Fell and Duver (2024c)*
5 *Sheng et al (2025)*

Relationship to previous research

This study is an independent assessment and provides a high-level summary of a technical paper by Sheng et al[5], which details the modelling approach, data inputs and analytical results. It builds on earlier ABARES[1,3,4] research on the compilation of NTM data and the estimation of AVEs.

A key distinction is the scope of analysis. Whereas ABARES research examines NTMs across broad agricultural categories, including grains, livestock and horticulture, this study complements that work by focusing specifically on grain products and extending the dataset, drawn from multiple sources, to incorporate the most recent years.

ABARES' methodological contributions are acknowledged and appropriately referenced. Any interpretations or applications presented in this report are the responsibility of the authors.

AVEs of NTMs and how they are estimated

The AVEs of a NTM quantifies its trade impact by expressing the effect of the measure as a tariff-rate percentage. An AVE effectively converts the influence of an NTM, such as an SPS measure, TBT or MRL, into the tariff level that would generate an equivalent reduction in trade flows.

AVE estimation commonly employs the Gravity Model, a standard economic analytical model, used to examine the impact of NTMs on grain trade, which predicts bilateral trade volumes based on factors such as economic size, geographic distance and other trade costs.

A baseline level of trade is first estimated in the absence of NTMs, using observable characteristics including GDP, distance and shared borders. Indicators for NTMs are then incorporated to estimate the associated reduction in trade relative to this baseline. The estimated reduction is converted into a tariff-equivalent rate using the elasticity of import demand, allowing for consistent comparison of tariff and non-tariff barriers across products, sectors and countries. This study applies the methodology outlined by ABARES[4].

Positive AVE values indicate that an NTM restrict trade, while negative values promote trade. For example, a 10% of AVE has similar effect of imposing 10% tariff on the exported goods and a -10% has similar effect of tariff reduction by 10%.

Complications in the measurement of NTMs

Accounting for NTMs is inherently complex. This study builds on the approach proposed by ABARES[1,3] which incorporates mandatory NTM notifications submitted by World Trade Organisation (WTO) members and formal trade concerns raised at the WTO regarding other members' measures.

Estimating and modelling the effects of NTMs on exports is complicated by several factors[3]:

- **Multiple coverage**

  Most NTMs imposed by importing countries apply to multiple trading partners and frequently cover more than one product.

- **Unequal marginal effects**

  The trade impact of an additional NTM is not uniform; incremental effects may be limited or negligible depending on the nature of the measure.

- **Data interpretation challenges**

  Variations in recorded NTM counts do not necessarily reflect actual changes in trade restrictiveness. Differences in data collection method, accounting practice and reporting standards can influence recorded totals.

- **Ambiguous trade effects**

  Although many NTMs restrict trade, some may also support market confidence. Requirements related to labelling or traceability, for example, may increase compliance costs but could also strengthen consumer assurance, potentially offsetting negative trade impacts.

Globally, the number of NTMs has risen steadily from around 200 in 1990 to more than 6000 in 2020, with varying economic impacts on Australian exports.

Given these complexities, simple NTM counts are not a reliable indicator of trade effects. Robust estimation and modelling are required to accurately assess the economic impacts of specific NTMs, including those anticipated in the future, on exports production and the broader economy.

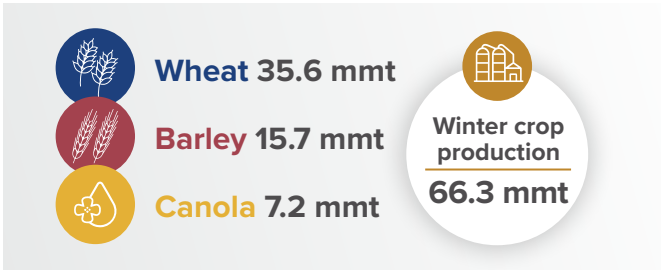
AUSTRALIA'S GRAIN PRODUCTION AND EXPORT GROWTH TO NEIGHBOURING MARKETS

In 2024/25, Australia's winter crop planting area expanded to a record 24.9 million hectares, an increase of 8% on the previous year. Total grain production is projected to reach approximately 66.3 mmt, with an estimated value of A$ 49.8 billion[6].

The production profile continues to be dominated by wheat, barley, oilseeds and pulses. Wheat accounts for an estimated **55%** of total output, followed by barley at **21.5%**, canola at **10.3%** and pulses at **9.0%**. Sorghum, oats and other coarse grains make up the remaining share of production.

Australia's grain exports have increased steadily since 2000, rising from approximately **15-20 mmt** in the 1990s to an estimated **39.6 mmt** in 2024/25. Over the same period, Australia's share of global grain exports has doubled from **5.4%** to **8.8%** *(Figure 2)*. In 2024/25, grain exports are valued at around **A$ 22.7 billion**, representing approximately **30%** of Australia's total agricultural export value. This highlights the continued importance of grain exports to Australia's overall agricultural trade performance and the wider economy.

Figure 1. **Australian winter crop production** 2024-25



SOURCE: Data used in this figure come from ABARES (2025).

The composition of Australia's grain export markets has changed markedly over time. In the 1990s, approximately **40%** of grain exports were directed to the Middle East. By 2024/25, an estimated **65%** of exports were destined for the Asia-Pacific region, consistent with the region's expanding requirements, where Australia's established trade relationships could support regional industrial and processing interests.

Australia's grain exports increased by approximately **10%** in 2024/25, reaching **39.6 mmt**, following a decline in 2023/24. The recovery reflects changes in the global demand and supply. International wheat prices have been influenced by various externalities, including shifting global logistics, shipping lane disruptions, and supply-chain adjustments. Australian grain exports to Europe subsequently rose by around **15%**.

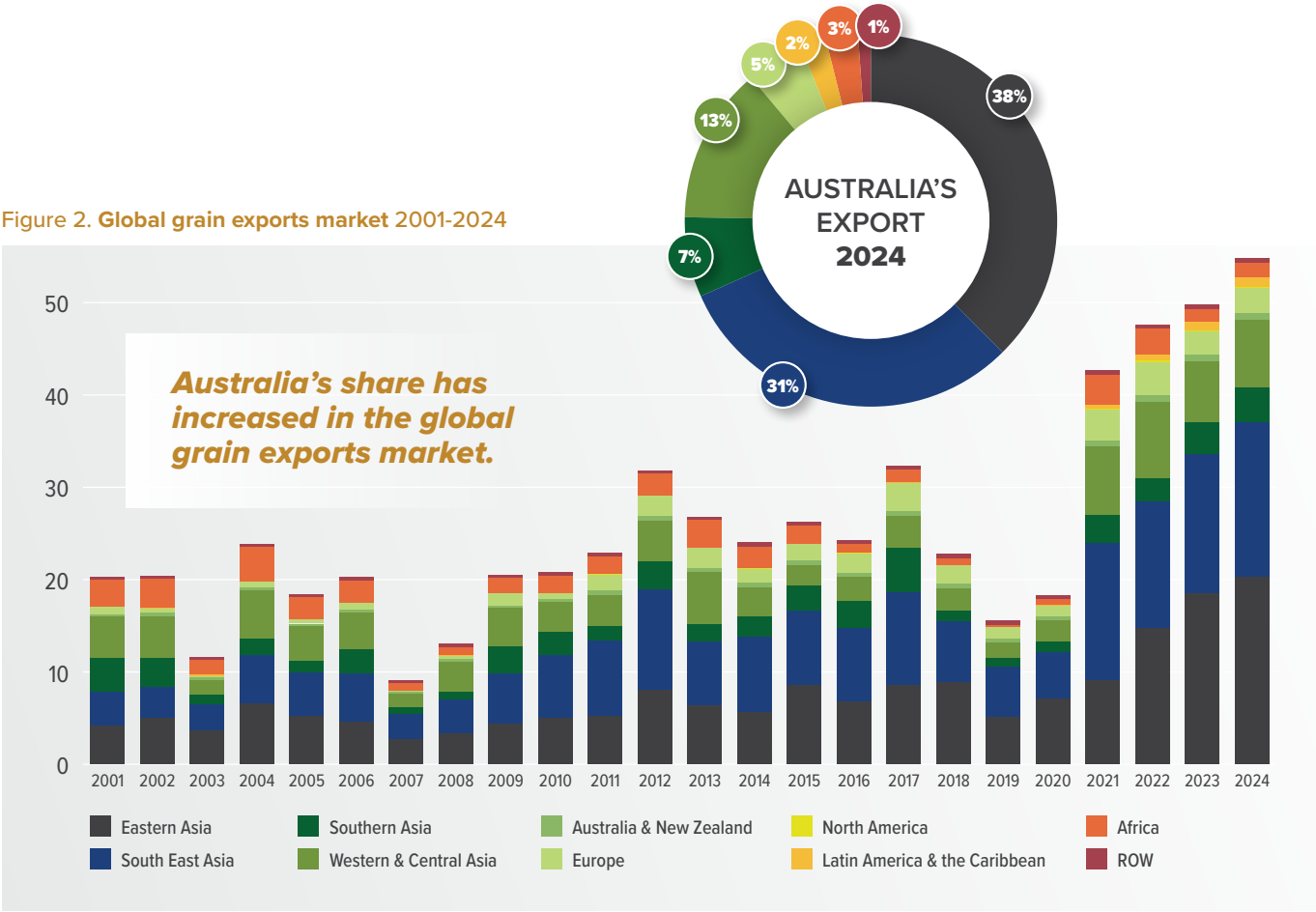
At the same time, global supply conditions have eased. Higher production in the United States, including a **5 mmt** increase in corn output, and strong growth in Brazil's soybean production have contributed to greater overall grain availability, moderating global price pressures. These combined factors supported Australia's 2024/25 export performance relative to the record **47.8 mmt** exported in 2022/23.

Looking ahead, trade conditions are expected to remain uncertain. Elevated trade tensions, including higher United States tariffs, may influence global competitiveness and create potential opportunities for alternative suppliers such as Australia. However, the risk of increased NTMs among major grain-importing countries may offset some of these potential gains. According to Asia-Pacific Economic Cooperation (APEC)[7], some importers are making greater use of NTMs to manage domestic market volatility, which may present longer-term challenges for the growth and stability of Australia's grain export sector.

6 *ABARES (2025) by ABARES (finalised in April 2025)*

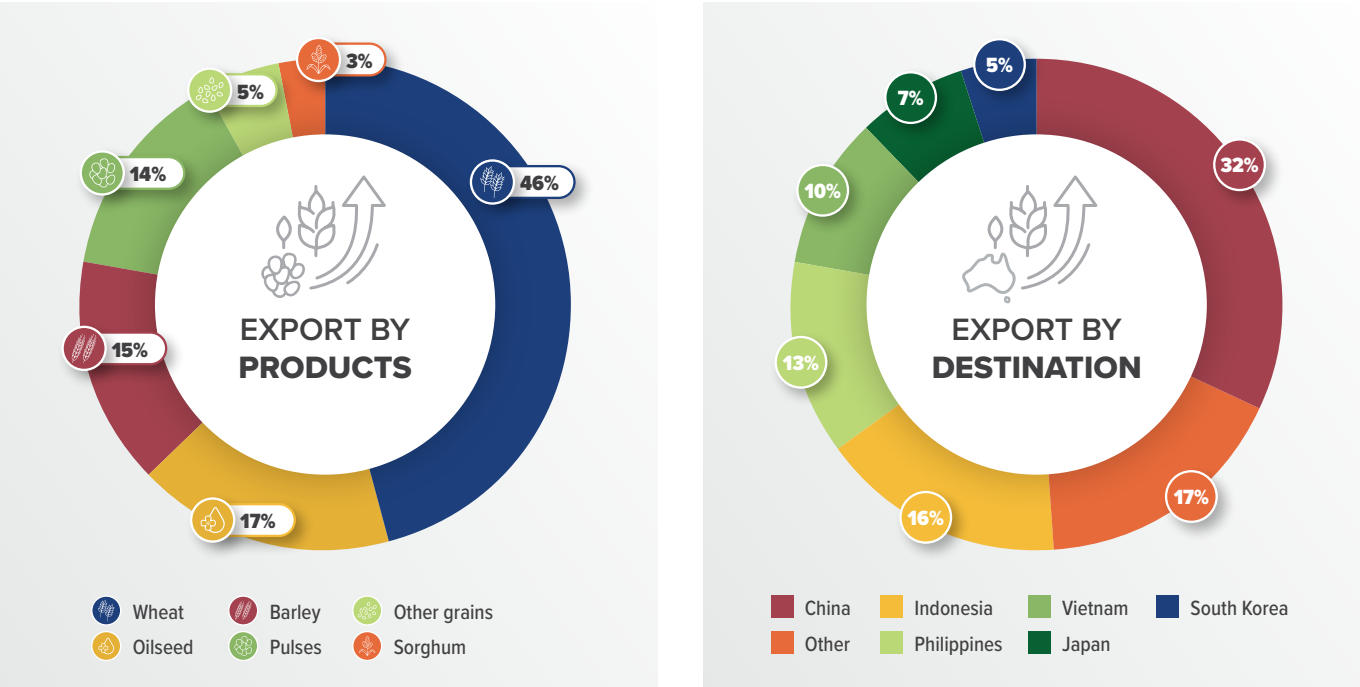
7 *APEC (2023) APEC Workshop to Identify Future Work on Non-Tariff Measures (NTMs) Affecting Grain Trade | APEC*

Figure 2. **Global grain exports market** 2001-2024



SOURCE: Data used come from Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) (2025), Crops and livestock products available at www.fao.org/faostat/en/#data/TCL

Figure 3. **Australian grain exports by products and destinations** 2024-25



SOURCE: Data used in this figure come from FAOSTAT (2025), Detailed trade matrix which is available at www.fao.org/faostat/en/#data/TM

RISING NON-TARIFF MEASURES AFFECTING AUSTRALIA'S GRAIN EXPORTS

According to ABARES[1] analysis, global tariff levels have declined significantly since the 1994 Uruguay Round Agreement. As tariff barriers have eased, greater attention has shifted to NTMs particularly SPS, TBT and MRL measures which have become increasingly prominent constraints to market access *(Figure 5)*.

This trend is reflected in WTO notifications for agricultural products. Between 1994 and 2024:

- SPS notifications increased from **230** to **1250**.
- TBT notifications increased from **370** to **2150**.
- MRL-related notifications rose more than **15-fold**, from around **7** notifications in 1995 to more than **400** per year by 2020[9].

By 2024, more than **6000 NTMs** were in force across over 100 countries, collectively affecting an estimated **90%** of global grain trade *(Figure 4)*.

The impact of NTMs on Australia's grain exports has broadly aligned with global trends and coincides with a gradual shift in export destinations toward East and South Asia, and Association of Southeast Asian Nations (ASEAN) member countries. Over the same period, the number of NTMs applied to Australian grain exports has increased, reflecting heightened public health requirements and the influence of regional trade agreements. Coverage ratios, measuring the percentage of a country's import value subject to regulations, for wheat and sorghum rose steadily and stabilised at approximately **20%** at **10%**, respectively, between 2015 and 2024. In contrast, average tariff rates declined from **13.5%** to **8.4%** over this period.

Coverage ratios for barley, canola and oats have declined slightly; however, available evidence indicates that the overall restrictiveness of NTMs affecting these commodities has intensified.

As NTM counts and coverage ratios cannot be directly used to quantify the impact of NTMs on Australia's grain trade and how this has changed over time, this study converts them to AVEs or TEs, following the approach used by ABARES[6]. Between 2000 and 2024, the estimated TEs for NTMs applied to Australian grain exports averaged **20.4%**, compared with a global average tariff of **10.6%**.

This NTM burden was approximately four times higher than the average tariff rate imposed by Australia's top ten grain-importing destinations (**4.7%**) *(Figure 6)*.

Reported by ABARES[8], the estimated TE for grain exports exceeded the TE for Australia's overall exports (**19%**), while remaining well below the global average of **86.6%**.

Figure 4a. **Global trend of NTMs by type:** (1980-81 to 2024-25)

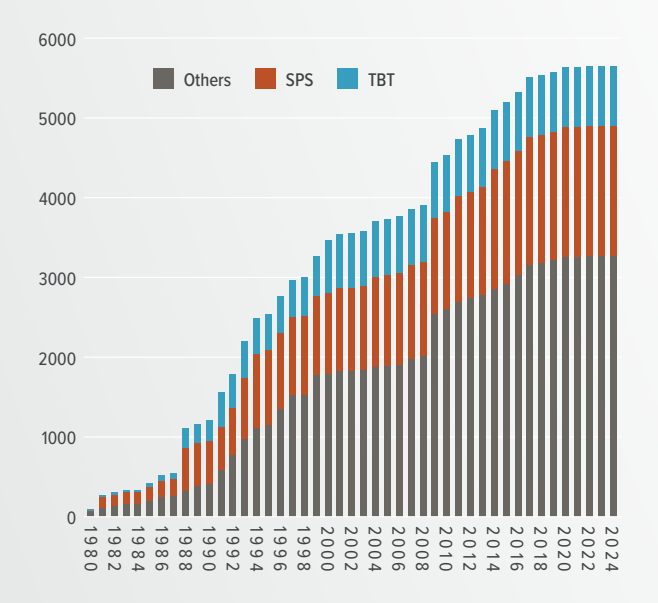
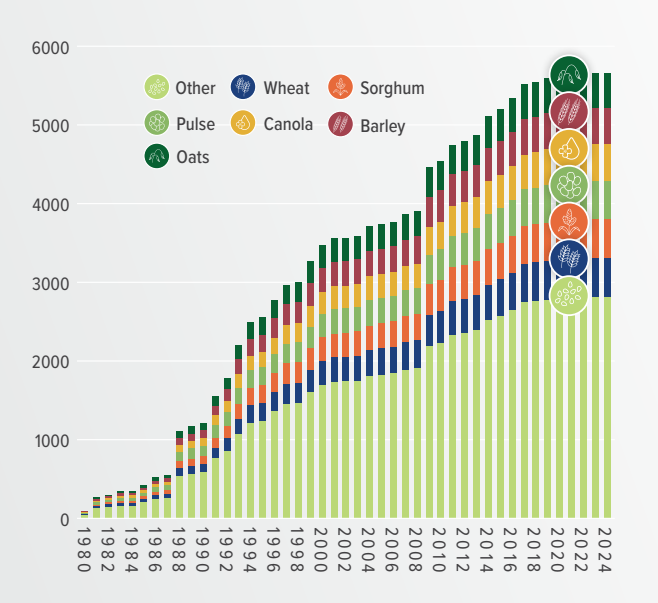


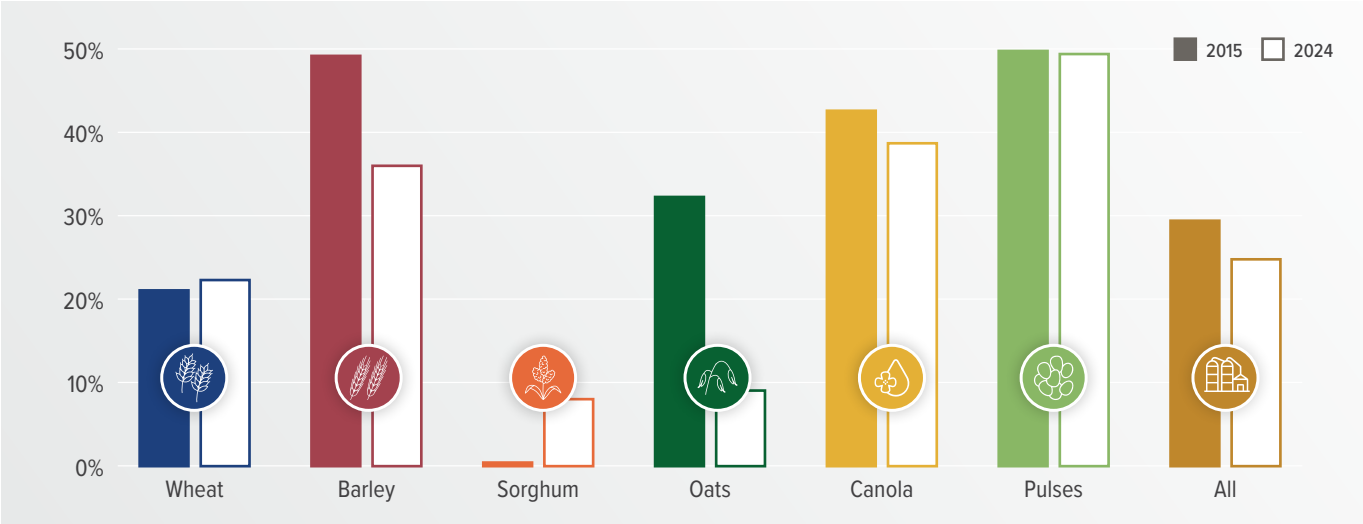
Figure 4b. **Global trend of NTMs by product:** (1980-81 to 2024-25)



SOURCE: Authors' own estimation by using the data from TRAINS (2025), and the original data are available from TRAINS Portal at https://trainsonline.unctad.org.

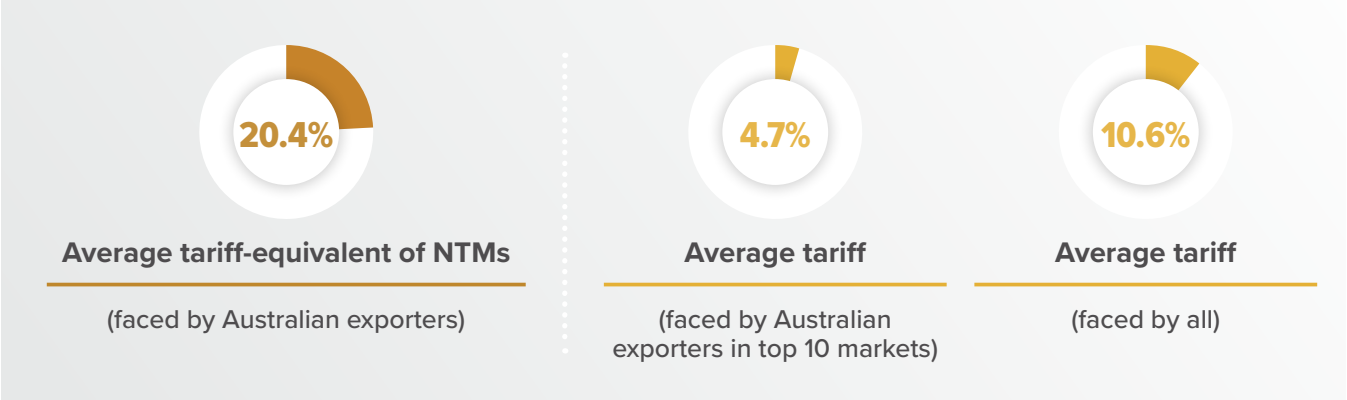
8 *Fell and Duver (2022)*
9 *WTO (2025) - WTO | WTO Annual Report 2025*

Figure 5. **Coverage ratio of NTMs faced by Australian grains exporters:** commodity



SOURCE: Authors' own estimation by using the data from TRAINS (2025), and the original data are available from TRAINS Portal at https://trainsonline.unctad.org. The y axile is the coverage ratio, which is defined as the share of a country's trade (or specific products) that is affected by one or more NTMs. The coverage ratio of non-tariff measures (NTMs) is a standard indicator used in international trade analysis (UNCTAD, WTO, World Bank, ABARES).

Figure 6. **Comparison between tariffs and NTMs for grains exports**



SOURCE: The estimated AVEs of NTMs are obtained from Sheng et al. (2025), Figure 4.4 (Estimated ad valorem equivalent of NTMs on Australian grain exports).

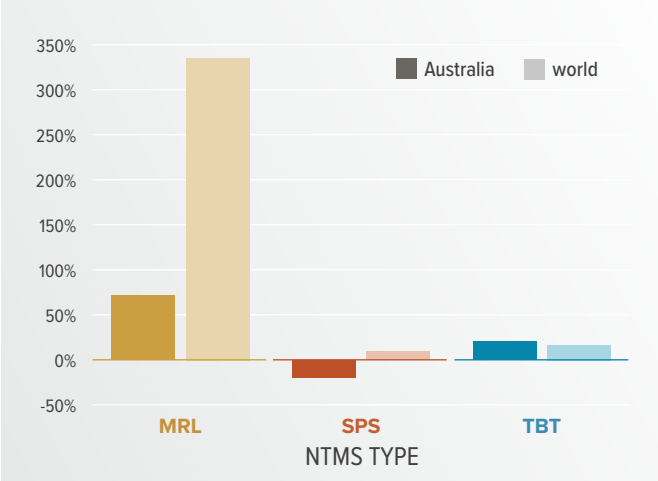
DIVERGENT EFFECTS OF NON-TARIFF MEASURES ON AUSTRALIAN GRAIN EXPORTS

While NTMs have a negative effect on Australia's grain exports, their impacts vary substantially by type. The estimated TEs indicates that TBTs have a similar effect of imposing tariff by **20.3%** on Australian exports, consistent with global patterns *(Figure 7)*.

By contrast, the estimated TE for SPS requirements applied to Australian grains is **–19.0%**, implying an effect equivalent to a **19%** quality premium that favours exports. Globally, however, the TEs averages **9.9%**, constraining grain exports across exporting countries. This reflects the benefits of the higher quality of Australian products and the higher safety standards that we uphold relative to our competitors.

For MRLs, the estimated tariff equivalent measure averages **71.5%** making them more restrictive than TBTs (**20.3%**). This implies global attention has been focused more on the MRL to safeguard human health. Consistency in global MRL standards could be achieved by ensuring they are set based on scientific consensus, providing clarity and measurability across different standards. However, the MRL measure faced by Australian farmers is still well below the global average of **335.8%**, suggesting that the Australian MRLs standard are more harmonised with international scientific consensus relative to our competitors *(Figure 8)*.

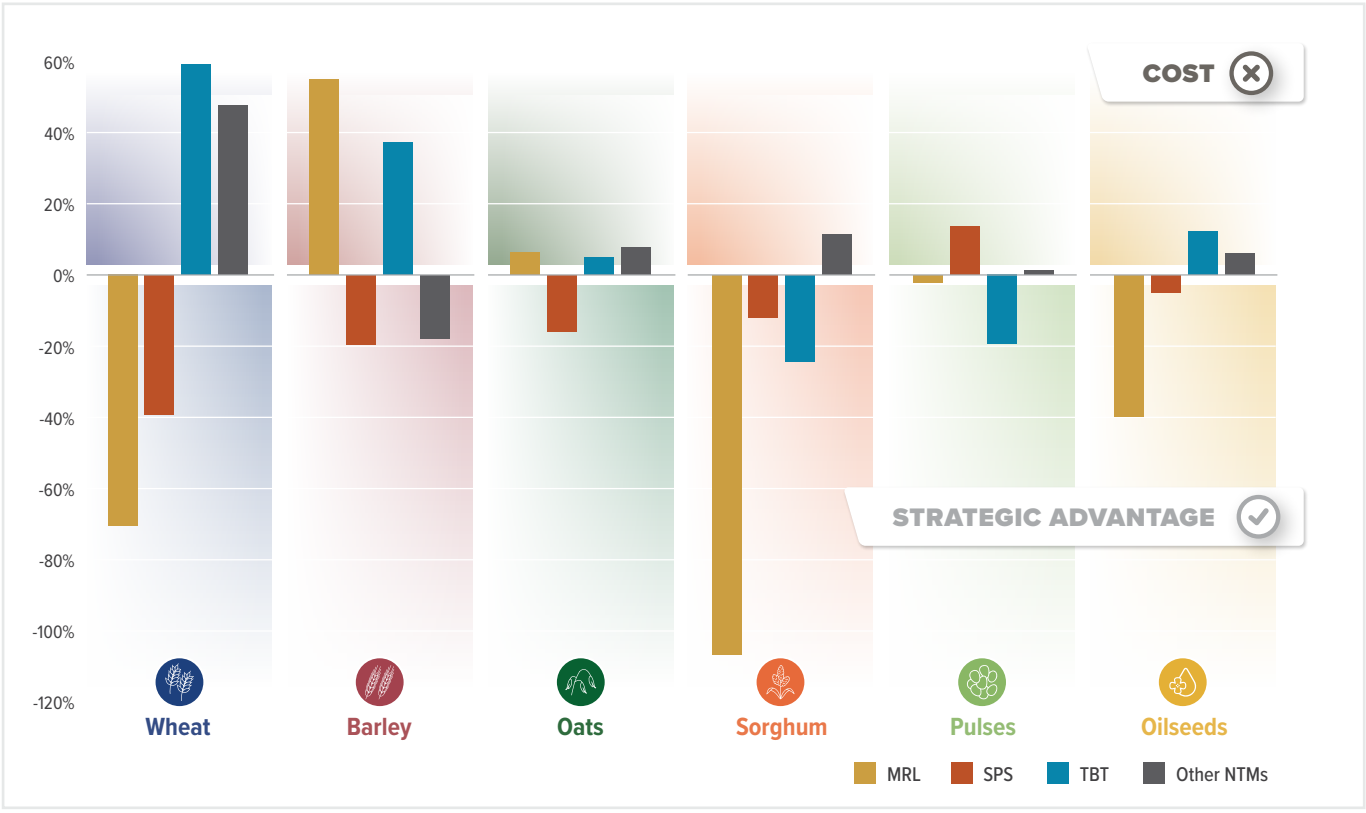
Figure 7. **Estimated AVEs of NTMs:** Australia vs. world



SOURCE: Authors' estimates using Sheng et al. (2025)

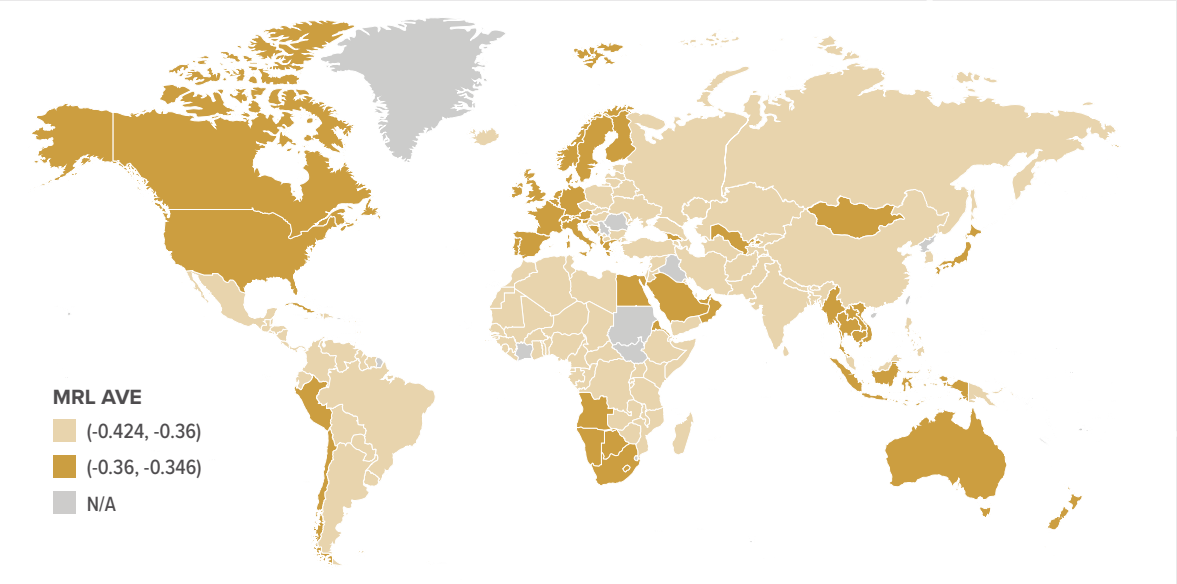
These results highlight the divergent roles played by different types of NTMs and demonstrate the importance of examining their effects through TEs rather than simple counts or coverage ratios *(Figure 9)*.

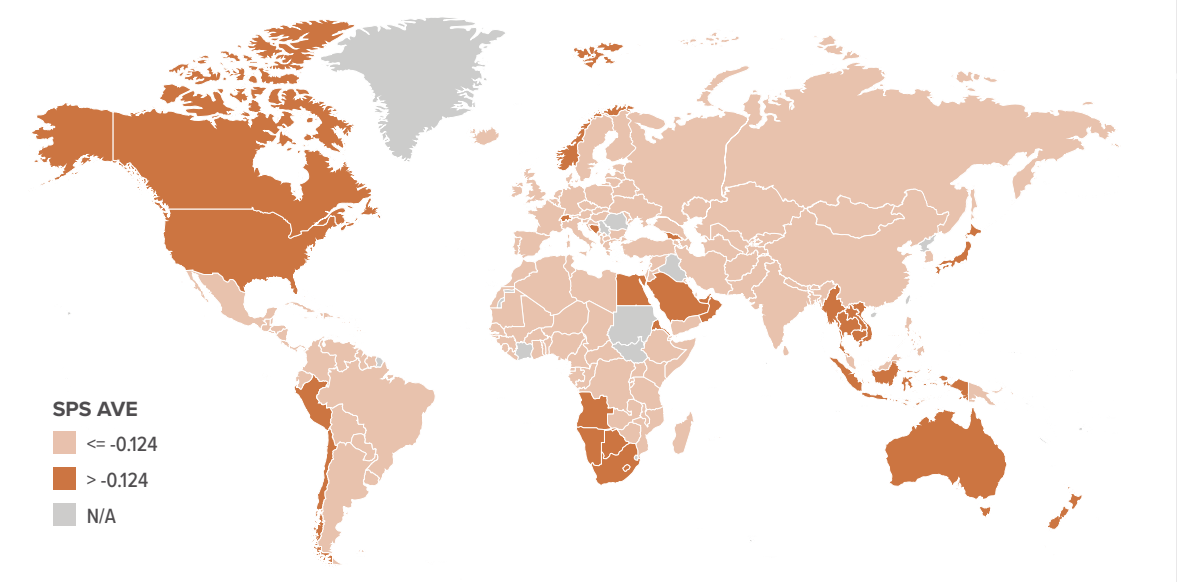
Figure 8. **Estimated AVEs of NTMs by type and product**

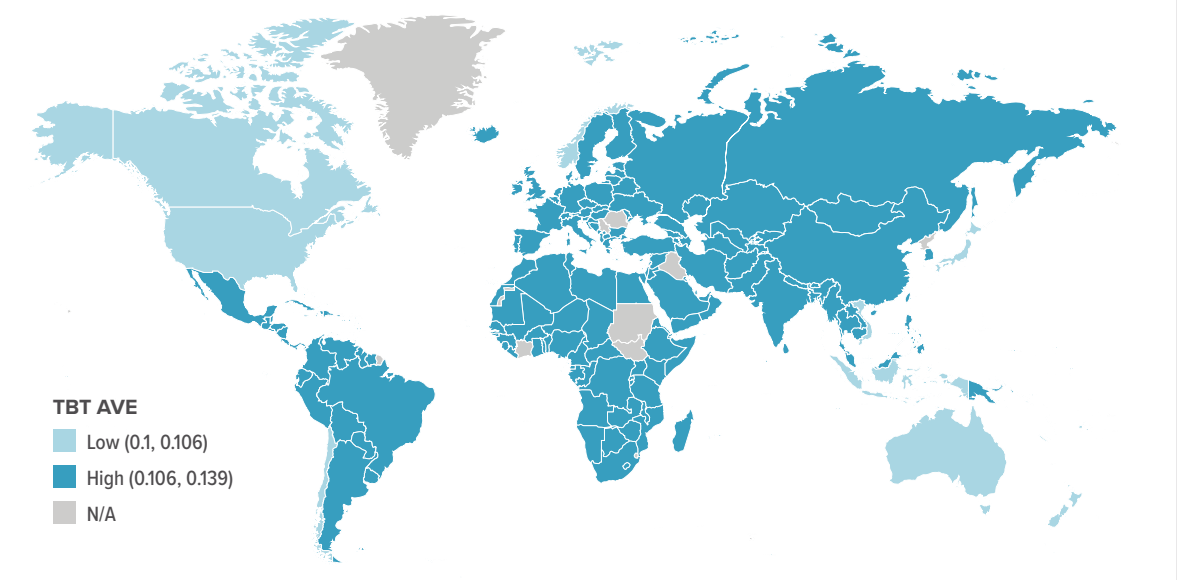


SOURCE: Sheng et al. (2025), Table 4.5 (Quantity-based estimation), Other NTMs include non-automatic licensing, quotas, prohibitions and quantity-control measures.

Figure 9. **Estimated NTMs AVEs by type and export destination**







SOURCE: Authors' estimates using the estimates from Sheng et al. (2025). The high, low and nil standards are defined for MRL, TBT and SPS separately.

BENEFITS TO AUSTRALIA FROM EASING NON-TARIFF MEASURES

There are several potential avenues through which the effects of NTMs could be mitigated, with associated implications for Australia's grain industry and the broader economy.

This analysis considers three illustrative scenarios:

- **Reducing the trade-distorting effects of NTMs on Australian grains by 50%.**
- **Removal of quantitative restriction equivalently to reducing the trade-distorting effects of NTMs by 50%.**
- **Reducing the trade-distorting effects of NTMs by 20% and 10%, respectively.**

These are illustrative scenarios only, not policy recommendations.

These scenarios serve as illustrative examples only to indicate the direction of economic benefits and potential magnitude. These are not policy recommendations. Achieving such outcomes would require case-by-case analysis of individual NTMs, strong resourcing for technical market access negotiations, and proactive engagement from industry and government both domestically and overseas. The modelling assumes immediate and comprehensive implementation, acknowledging that real world processes would involve significant practical and external constraints.

In addition to the scenario assessment, the analysis examines the potential contribution of complementary domestic reforms such as increased public investment in research and development, infrastructure improvements and administrative streamlining to assess their capacity to mitigate the negative impacts of NTMs.

Significant benefits from halving NTMs

This scenario is modelled using the Global Trade Analysis Project (GTAP) framework, which considered a world-leading standard for analysing global economic policies. The study identifies a theoretical state where international demand for Australian grain exports could expand by **5.2 mmt**. This represents the scale of the market opportunity identified by the research. This rise is primarily driven by an additional **5.5 mmt** of wheat (**23.4%**) and **0.04 mmt** of barley (**0.5%**), partially offset by small reductions in exports of sorghum (**0.1 mmt**) and canola (**0.2 mmt**). Approximately **86%** of the additional export volumes are projected to be directed to Asian markets. While actual production is fundamentally anchored by seasonal rainfall and soil types, the simulation suggests that practically addressing NTMs would allow the sector to respond more efficiently to high-value global demand." *(Figure 10, panel a)*. This includes a **19.4%** increase in wheat production (**6.6 mmt**) and a **0.3%** increase in barley (**0.04 mmt**). Small reductions are estimated for canola (**0.12 mmt**; **2.2%**) and pulses (**0.05 mmt**; **1.5%**), reflecting assumed resource reallocation toward commodities with higher expected returns under reduced trade barriers. Model results also point to broader economy-wide benefits. National real GDP is projected to increase by 0.49 per cent (around **A$ 13 billion**), while national welfare is estimated to rise by A$ 7.8 billion *(Figure 10, panel b)*. Wheat growers' net income is projected to increase by around **A$ 1 billion**, and employment is estimated to expand by approximately **12,000 positions** across grain processing, logistics and related services *(Figure 10, panel c)*.

These estimates are based on a set of simplifying modelling assumptions that do not fully capture all on-the-ground adjustments. In particular, total input resources such as farmland are assumed to be fixed. In practice, reductions in NTMs would likely strengthen export expectations and incentivise farmers to expand production through additional inputs. As a result, the estimated impacts should be interpreted as conservative, with the potential for larger economic gains under real-world conditions.

Modelling Simulation: GTAP

This study assesses the potential economic impacts of reducing NTMs using a computable general equilibrium (CGE) model based on the GTAP framework.

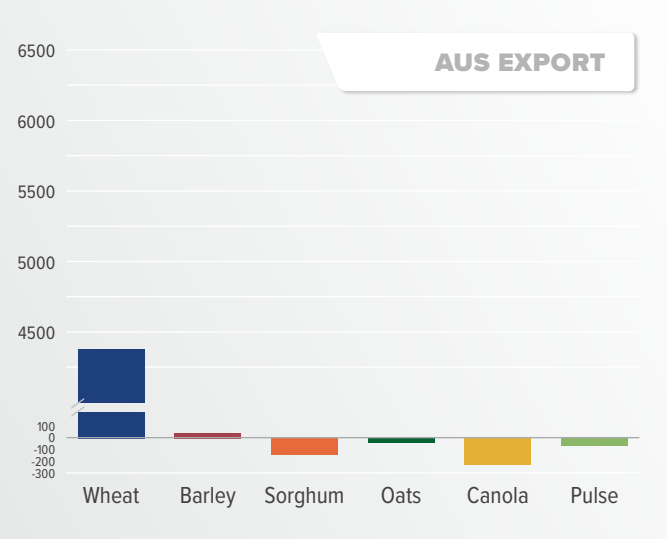
GTAP is a widely used framework for analysing how changes in trade policy affect production, trade and incomes across countries and industries. The model incorporates data from more than 65 regions and over 200 sectors, capturing global interconnections through trade flows and resource allocation. This allows assessment of how reductions in the trade-distorting effects of NTMs influence the grain sector and generate broader economic adjustments in production, employment and trade patterns.

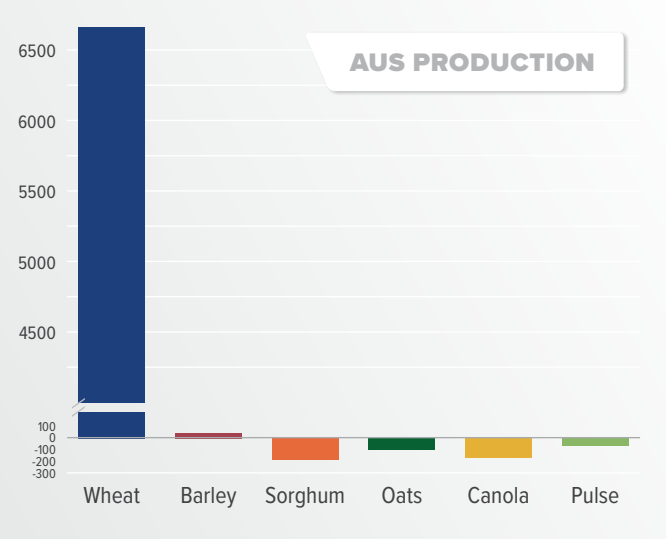
The GTAP framework tracks the reallocation of land, labour and capital across industries, adjusts bilateral export and import flows under new policy settings and estimates associated changes in national welfare and economic growth.

This analysis uses the GTAP database[10] to simulate reductions in NTMs. The baseline scenario applies a 50% reduction in the estimated TEs of NTMs on Australian grain exports, with additional scenarios applying 10% and 20% reductions. An alternative scenario models the reduction in NTMs as the removal of equivalent quantitative restrictions.

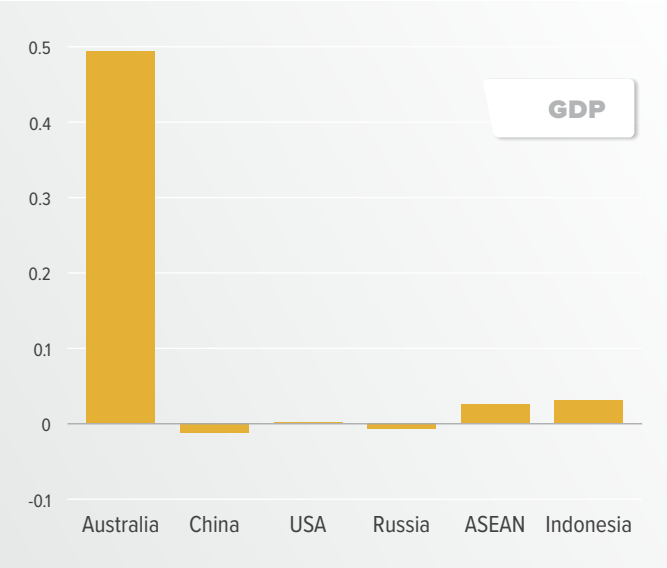
10 GTAP (2023) GTAP The Global Trade Analysis Project (GTAP) Data Base: Version 11, *Journal of Global Economic Analysis*, 7(2) Deriving a Global Social Accounting Matrix, GTAP Technical Paper No. 22: GTAP Data Bases: GTAP 11 Data Base

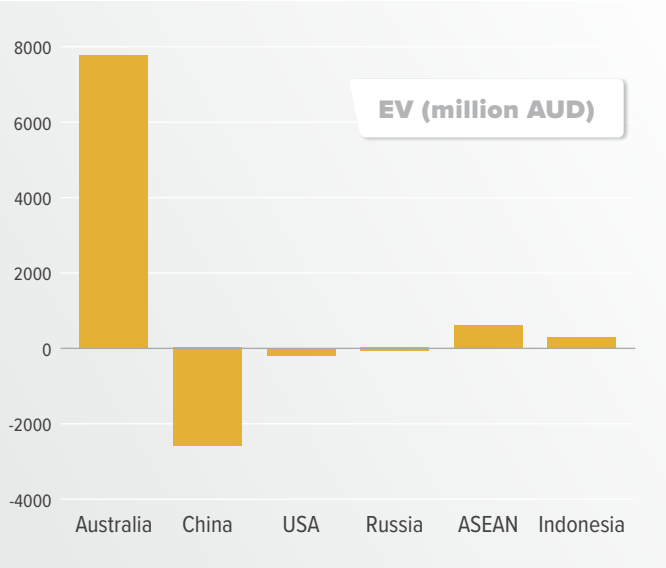
Figure 10. **Estimated impact of NTMs cut:** trade, production and the macroeconomy



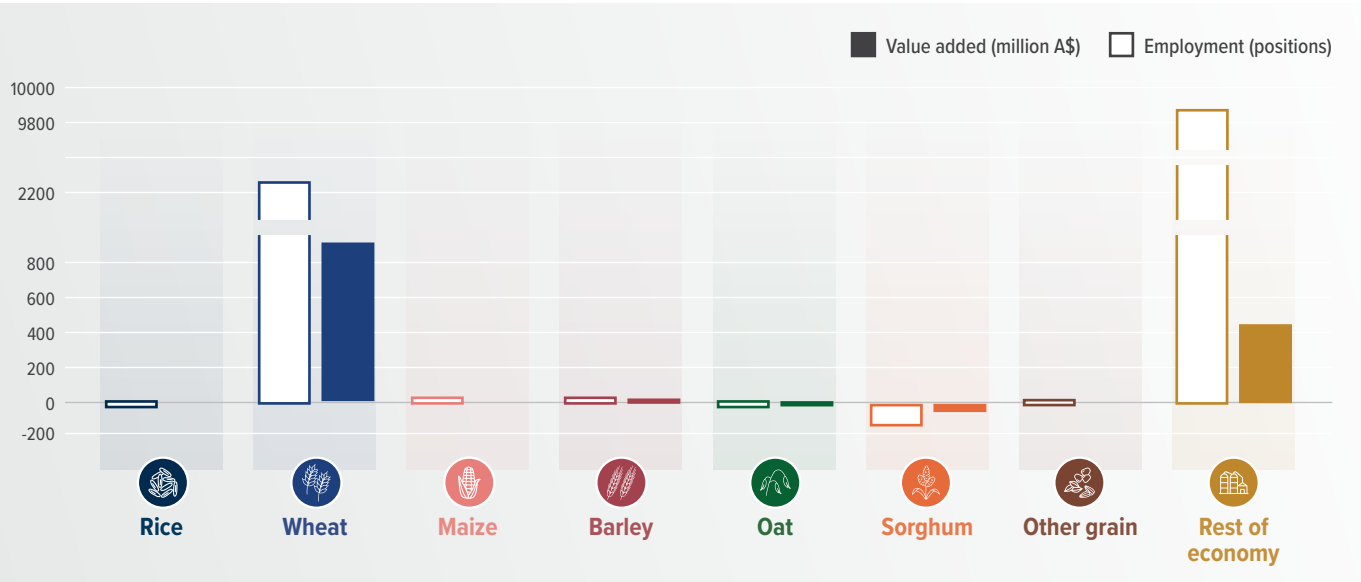


(a) Impact on Australian grain export and production (kt)





(b) Impact on GDP (%) and national welfare (A$ million), Australia



(c) Value added (million A$) and employment (positions)

NOTE: National Welfare is measured by using the consumer surplus, while Value-added is measured by the newly-created value from the industry through utilizing primary factors and intermediate inputs in production process. For example, if using $90 production inputs to create $100 output, the industry generates $10 in value added. SOURCE: Authors' estimates using Sheng et al. (2025).

Small reductions are estimated for canola (**0.12 mmt**; **2.2%**) and pulses (**0.05 mmt**; **1.5%**), reflecting resource reallocation toward commodities with higher expected returns under reduced trade barriers.

Model results indicate broader economic effects. National real GDP is projected to increase by **0.49%** (around **A$ 13 billion**), while national welfare, measured as the combined surplus of consumers and producers, would increase by **A$ 7.8 billion** *(Figure 10, panel b)*. Wheat growers' net income is estimated to rise by around **A$ 1 billion**, and employment is projected to increase by approximately **12,000 positions** across grain processing, logistics and related services *(Figure 10, panel c)*.

At the global level, the impacts are mixed. Grain exports from the United States and Canada are projected to decline by **1.3%** and **3.6%**, respectively, as Australia gains a larger share of export markets. Australia is able to benefit from NTMs reduction because we are better placed to minimize the impact of NTMs through domestic reform and bilateral negotiations where successful outcomes rest mainly on competitive price and superior quality.

By contrast, major ASEAN importers such as Vietnam and Indonesia would also realise net benefits associated with lower costs and improved supply security as a result of NTMs reduction.

An alternative scenario examines the effects of the reduction of quantitative import restrictions such as quotas that already limit our exports applied by Australia's major grain-importing partners. In this model, these quantitative restrictions represent a more restrictive form of trade barrier, as it limits trade flexibility to a greater extent than regulatory easing.

Under this scenario, the impacts on Australia's grain exports and production are comparable to the previous scenario. However, the composition of trade and production effects differs modestly due to the fixed nature of quantitative constraints.

Key differences include:

- **Wheat**

  Wheat exports increase by **9.0 mmt**, alongside a **10.9 mmt** increase in production.

- **Oats and sorghum**

  In contrast to the TE-reduction scenario, both oats and sorghum are projected to record increases in exports and production. Oats exports rise by **0.03 mmt**, with production increasing by **0.07 mmt**, while sorghum exports and production increase by **0.13 mmt** and **0.16 mmt**, respectively.

- **Economy-wide effects**

  Economy-wide gains, including increases in national real GDP and national welfare, are larger under this scenario, reflecting stronger substitution effects across sectors.

Overall, while aggregate gains for Australia remain comparable across scenarios, modelling quantitative restrictions as the basis for NTM reduction results in a different distribution of impacts across commodities and sectors.

Effects of smaller reductions in NTMs

International trade negotiations are inherently complex, and politically challenging. More moderate reductions of 20% or 10% therefore offer more realistic scenarios for assessing the potential scale of economic impacts.

Under a 20% reduction in NTMs, Australia's grain exports are projected to increase by **2.2 mmt** (**6.0%**), with domestic production rising by **2.6 mmt** (**4.6%**), including a **5.3%** increase in wheat output. Model results indicate associated increases in national welfare of **A$ 3.1 billion**, and an estimated **4,800 additional jobs**, primarily in grain production, processing and logistics.

A 10% reduction in NTMs is estimated to generate approximately half these effects, including an increase of **1.1 mmt** (**3.0%**) in exports and **1.3 mmt** (**2.3%**) in production.

Although the estimated gains are relatively smaller, the results indicate that incremental reductions in NTMs would deliver measurable improvements in exports, production, national welfare and employment outcomes for the Australian grain sector and associated supply chains.

SPILLOVER EFFECTS ACROSS UPSTREAM AND DOWNSTREAM INDUSTRIES

Reductions in NTMs influence all stages of the grain value chain, from on-farm production through to downstream processing and final consumption. For example, higher grain exports and production would increase demand for key inputs, while also supplying more competitively priced grain to food processing industries. A reduction in inefficient NTMs is expected to lower trade costs and strengthen Australia's position in global value chains (GVC), improving the competitiveness of Australian grain products. The size and nature of these effects vary across commodities, reflecting differences in production systems, processing requirements and market demand.

Increased wheat and barley exports and production are estimated to generate higher demand for upstream inputs. While physical inputs like fertilisers and machinery are often imported, the projected **5–8%** increase in upstream value-added refers specifically to the domestic professional services required to support the industry. These domestic drivers include but are not limited to:

- **Logistics & Infrastructure:** Increased use of railway, road, and water transport.
- **Professional Services:** Higher demand for agronomic advice, finance, and technical knowledge.
- **Employment:** A modest reform scenario (**10%**) could deliver an estimated **2,400** additional jobs primarily in these local service sectors.

These changes also support increased activity in downstream industries through higher processing volumes and export flows, with estimated increases of up to **3–6%**. Not all spillover effects are uniform across commodities. For example, oilseed production and exports (such as canola) are projected to increase, resulting in a positive downstream spillover of up to **2%**.

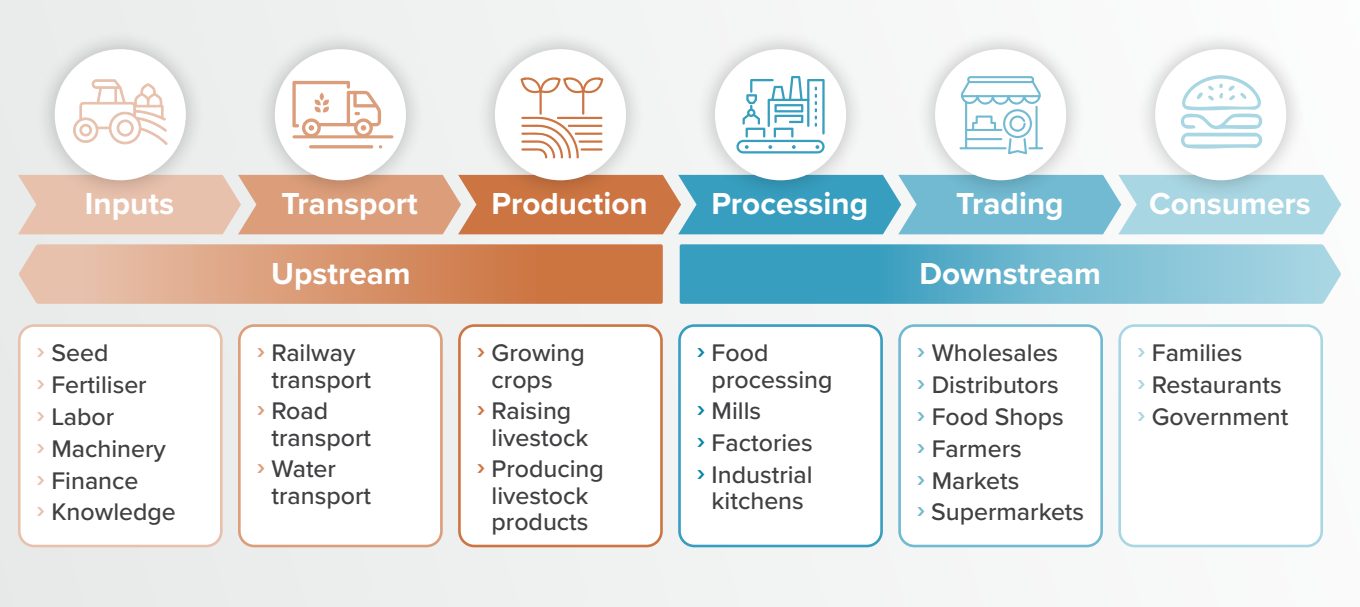
However, a modest negative upstream effect of up to **–1%** is also estimated, reflecting differences in relative competitiveness between oilseeds and other grain products and the shared use of upstream inputs.

Reductions in TE of NTMs are also estimated to influence Australia's position within GVC by affecting linkages between the grain sector and upstream and downstream industries. Using the revealed comparative advantage (RCA) index - which measures a product's export share relative to a country's overall exports - a reduction in NTMs is projected to increase the international competitiveness of Australian wheat and barley exports by up to **12%** and **9%**, respectively.

These results are consistent with research indicating that higher standards can have differentiated effects across exporters. Established exporters with well-developed supply chains and capabilities may experience fewer adjustment costs, while emerging exporters may face relatively higher compliance requirements[11].

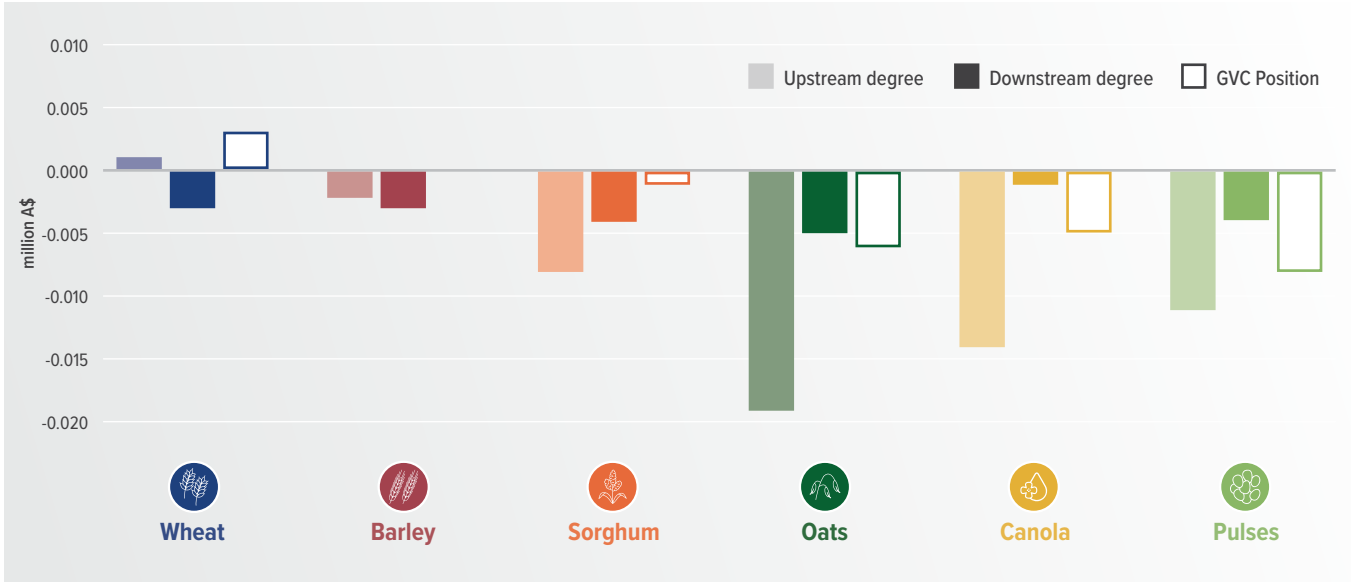
11 Disdier and Marette (2010)

Figure 11. **Value-chain of grain industry**

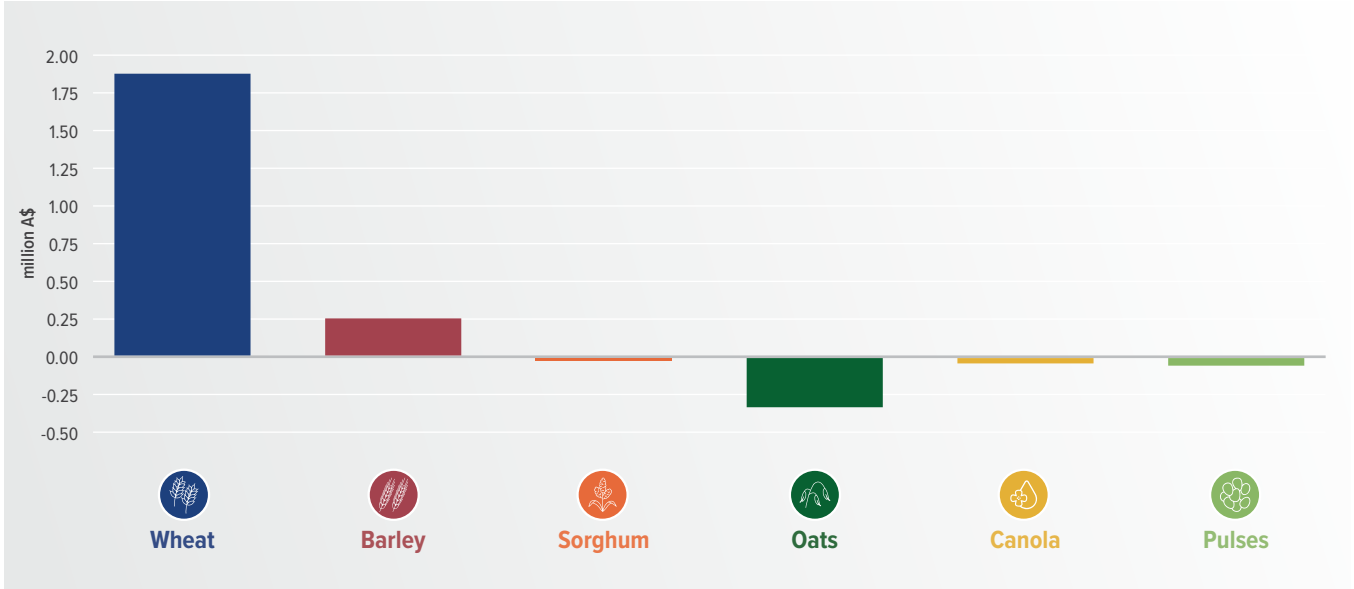


NOTE: the figure is made for illustrative purpose.

Figure 12. **GVC strategic advantage of NTMs reduction**



(a) Impact of NTMs cut on upstream and downstream industries



(b) RCA index

Source: Sheng et al. (2025), Table 6.3 (The impact of NTM reduction on Australia's grain GVC indicators). ***Revealed Comparative Advantage (RCA)*** *is an index used to measure a country's relative export strength in a particular product or sector compared with its share in global trade. It indicates whether a country is specialised in producing and exporting a given commodity.*

ADDRESSING NON-TARIFF MEASURES

The analysis indicates that NTMs have become a persistent feature of global grain markets and are unlikely to decline without sustained engagement. Their continued expansion reflects a combination of legitimate public-interest objectives and more contested policy drivers, contributing to the complexity of addressing them. Australia's established reputation for high safety and quality standards provides a strong foundation for managing these measures; however, reducing trade-distorting NTMs would deliver substantial benefits for the grain sector and the broader economy. Proactive and strategic engagement with NTMs is therefore important.

Historically, the Australian grain industry has tended to respond to NTMs once they are introduced. The current environment, however, requires a more anticipatory approach that identifies potential policy developments before they progress into formal trade barriers. Key elements of a proactive strategy include:

- **Engagement at the policy development stage**
  Working with key trading partners during early policy formulation can help ensure the design of NTMs is practical, science-based and consistent with international standards. Technical cooperation and dialogue can assist in reducing the likelihood of measures that impose unnecessary trade costs.
- **Strategic foresight and analysis**
  Applying forward-looking analytical tools to anticipate potential NTMs enables more timely and targeted responses.

Differentiated NTM impacts across measure types, grain products and export destinations highlight the need for a targeted and flexible approach. Prioritising key markets, sequencing engagement appropriately and tailoring responses to specific and changing circumstances can improve the effectiveness of negotiation efforts.

This requires concentration of diplomatic and technical efforts on key growth markets.

Targeted engagement is particularly important given the concentration of Australia's grain exports in the small number of markets where NTMs have the greatest influence on trade outcomes.

International negotiations should focus on removing inefficient and duplicative NTMs that make Australian export more costly. As a complementary strategy, we should promote Australia's superior compliance and quality assurance systems in order to mitigate impacts or achieve the goal more effectively.

In parallel with international engagement, domestic reforms can help manage the adjustment effects of NTM changes. The reform should focus on increasing investment and representation of industry in the negotiation to ensure that international standards are developed based on scientific principles and practical farming practices.

Equally important are streamlining domestic regulations and practice to eliminate redundant internal paperwork and inefficient compliance hurdles, so that the grain sector can adapt to evolving global rules without unnecessary costs.

Data sources and adjustments

This study draws on major publicly available databases commonly used to measure and analyse NTMs. These sources provide information on grain trade values and volumes, tariffs and NTM incidents from 1980 to 2024 (or the latest available year). Each dataset offers different strengths in terms of coverage, detail and time-series consistency. In total, more than 800,000 entries were compiled, covering 28 commodities at the Harmonised System 6-digit level (HS6) across 258 countries and regions.

Key data sources include:

- **United Nations Conference on Trade and Development (UNCTAD) Trade Analysis and Information System (TRAINS)**
  Records NTMs at the HS6, enabling identification of measures applied by 258 economies across 28 grain products.
- **World Integrated Trade Solution (WITS) World Bank / UNCTAD Economic Research Institute for ASEAN (ERIA)**
  Supplements NTM information with HS 10-digit, monthly data for 258 economies from 2008 to 2023.
- **Vienna Institute for International Economic Studies (WIIW) WTO Notification Database**
  Used to cross-check NTM notifications reported by more than 100 importers since 1995.
- **Global Trade Alert**
  Documents trade-related interventions affecting 28 grain products in 202 economies from 2008 to 2024.
- **Organisation for Economic Co-operation and Development (OECD) Data**
  Provides information on grain quantities and prices by broad NTM categories.
- **GTAP v11**
  Used for CGE modelling of bilateral trade, production and protection. The grain sector was disaggregated to reflect Australia's key products and trading partners.

Compiling a consistent panel required extensive harmonisation across data sources. This included mapping more than 5,000 HS codes to 12 grain products, aligning information across multiple HS revisions, and regrouping countries into analytical regions, including major grain-trading partners such as China, the European Union, ASEAN and the United States.

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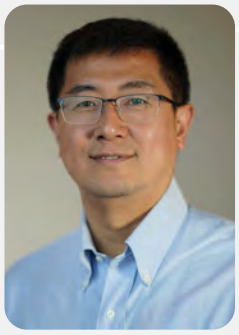
The research team brings together agricultural economists, econometricians and trade specialists from the Australian National University, James Cook University and international partner institutions.

The team combines deep expertise in agricultural production, international trade, productivity analysis and general equilibrium modelling, with experience spanning academia, government agencies such as ABARES, and global research organisations.



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Professor Yu Sheng leads the team and holds the Crawford Chair in Agricultural Economics at Australian National University (ANU). A former senior economist at ABARES, he has served as Vice-President of the Asian Society of Agricultural Economists and co-editor of the Australian Journal of Agricultural and Resource Economics. Professor Sheng has published more than 100 scholarly and policy works on agricultural productivity, trade policy and the economics of Australian agriculture, with research featured in journals including the American Journal of Agricultural Economics, Food Policy and World Development. He has led over 20 domestic and international research projects, with a particular focus on agricultural trade in the Asia–Pacific region and the implications of rising food demand in key markets.

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Dr Sizhong Sun is an Associate Professor of Economics at James Cook University with over fifteen years' experience in empirical international trade and industrial organisation. He specialises in structural gravity modelling and policy evaluation and has published extensively in journals such as Economic Record, Energy Economics and Nature Human Behaviour. Dr Sun has held leadership roles in the Chinese Economics Society Australia and serves as a reviewer and guest editor for several academic journals. His expertise strengthens the project's analytical and econometric foundations.

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Grains Australia is an initiative of the Grains Research and Development Corporation

GRDC leads investment in grains research, development and extension in Australia to create enduring profitability for grain growers. A partnership between the Australian Government and grain growers, GRDC's primary objective is to drive the discovery, development and delivery of world-class innovation to enhance the productivity, profitability and sustainability of Australian grain growers and benefit the industry and the wider community.

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ANU Enterprise is the wholly owned engagement Company of the ANU. With a commercial discipline, we assist researchers to identify, connect, engage, and deliver their expertise to Government and Industry clients. ANU Enterprise provides the necessary assistance on an as required basis (including proposal and bid preparation, budget preparation, pricing, contract review, financial and contract management including milestone invoicing and expense administration with financial reporting and acquittals), allowing researchers to focus on what they do best. As a not-for-profit, for purpose company, ANU Enterprise has been providing services to the academic and research community of the ANU for over 46 years.


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