Global perspective of MRLs and their impacts on Australian grain price and access to international markets

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Key words

MRLs, market access, chemical regulation, social licence, consumer perception, sustainability, food security

Take home message

- The Australian grain industry must continuously adapt to meet the evolving demands of international markets. This includes understanding and complying with foreign trade regulations and consumer preferences, particularly in rapidly growing regions like Asia and Africa
- Effective management of chemical residues and strict adherence to Maximum Residue Limits (MRLs) are crucial. These practices not only ensure the safety and quality of Australian grain but also maintain access to crucial international markets
- There is a growing global emphasis on environmental sustainability in agriculture and consumer preferences for products with reduced pesticide usage
- To maintain global competitiveness and meet market standards, Australian farmers should continue adopting innovative agronomic practices. Technologies like selective spraying, integrated pest management, and sustainable farming techniques are vital for efficient and environmentally responsible grain production
- The industry faces challenges like economic pressures, pesticide resistance, and the need for regulatory compliance. Overcoming these challenges requires a balanced approach, combining efficient production methods with new technologies and practices that meet both domestic and international standards.

Background

As the world's population continues to grow, especially in Asia and Africa, the international market for Australian grain is expanding. This growth presents both unique opportunities and challenges for Australian growers, who must navigate a complex landscape of consumer preferences, sustainability standards, and trade regulations. Integral to this balance is the industry's commitment to following product label directions, ensuring spray quality, and minimizing drift – cornerstones of pesticide application that protect people, the environment and access to crucial crop protection products.

The fate of chemical residues from the point of application to the final exported commodity is a matter of growing importance, influenced by diverse conditions of pesticide application, label adherence, and the handling of grains throughout the supply chain. Moreover, the industry faces the ongoing task of aligning these practices with international Maximum Residue Limit (MRL) requirements, which sometimes diverge from domestic standards. The Australian grain industry's response to these challenges is not just about crop safety and yield; it's increasingly focused on residue levels, market requirements, and the sustainability of the grain industry into the future.

Market dynamics and demand

In the current global market landscape, the focus on chemical residues on food is intensifying. This heightened scrutiny is evident in both domestic and international markets, with an increasing demand for transparency regarding the residue status of Australian grain. Consumers are not only increasingly conscious about environmental sustainability standards within the grain industry but are also seeking products labelled as "free-from" or "non-glyphosate" certified. A study commissioned by CBH underscores this trend, revealing that 91% of consumers prioritize chemical residues as a paramount concern, with 36% considering it extremely important and 55% very important (CBH Group 2021). This surpasses other factors such as traceability, nutrition, and accreditation. Notably,

the concept of ‘regenerative’ agriculture, despite its growing prominence, ranked seventh in terms of importance among consumers.

This consumer-driven shift is influencing major industry players. Companies like Kellogg's and Nestlé are setting ambitious targets to reduce pesticide usage in their supply chains. Kellogg's, for instance, has committed to phasing out glyphosate as a pre-harvest drying agent in wheat and oats by 2025 and aims to reduce overall pesticide use on crops (Siegner, 2020 & LaMotte, 2023). Similarly, Nestlé is actively engaging with its suppliers to control pesticide use and manage any resultant residues, alongside assisting growers in transitioning to regenerative agricultural practices (LaMotte, 2023).

However, this shift towards stricter pesticide usage standards and sustainable practices must be carefully balanced against the needs of a growing global population. There is an ever-present demand for low-cost, efficient and sustainable food production, particularly in developing nations. This dichotomy presents a significant challenge for the Australian grain industry, which must navigate the complexities of meeting these evolving consumer demands and sustainability goals while maintaining its competitiveness in efficient food production.

Crop protection product’s usage in grain production

The role of crop protection products is foundational to the Australian grains industry, underpinning both food security and economic and environmental sustainability. Their judicious application throughout the grain production process – prior, in-crop, and post-harvest – adhering strictly to label directions, is critical. Herbicides, insecticides, and fungicides are indispensable in feeding a growing global population. However, the fate of these chemicals from application to the final exported grain encompasses a myriad of variables: diverse conditions of application, adherence to label rates, selective application across paddocks, the challenge of unregistered pesticide use, and the practice of segregating or blending grains along the supply chain.

Amidst economic pressures like rising input costs, interest rates, labor costs, and machinery expenses, and the looming threat of pesticide resistance, Australian farmers are turning to cutting-edge technology for profitability and global competitiveness (GrainGrowers, 2023). Innovations such as selective spraying solutions equipped with intelligent sensors – such as ‘green-on-brown’ in fallows have dramatically reduced overall herbicide usage (Fulwood, 2019). The adoption of integrated pest management (IPM) strategies within the grains industry has also been pivotal in mitigating pesticide resistance and reducing application rates (MacFayden *et al.,* 2014). With further innovations such as ‘green-on-green’, usage could be reduced further.

The potential removal of key pesticides from the Australian grains industry would be a retrogressive step, compelling farmers to revert to more conventional methods, including increased frequency of cultivation and crop residue burning. Such a shift could lead to a stark decline in crop yields, increased labor and fuel costs, environmental damage and heightened drought impacts for many grain growers. Crop protection products, thus, are not mere inputs but are integral to fulfilling the global demand for food security and sustainability. Their considered use is vital not only in maintaining but also enhancing the natural capital of Australia's farmlands, ensuring a legacy of productivity and environmental stewardship for future generations.

Setting and compliance with MRLs

Chemical regulation in Australia relies on a risk-based approach, grounded in scientific studies and data, and is designed to be impartial, free from political and commercial influence. The Australian Pesticides and Veterinary Medicines Authority (APVMA) plays a pivotal role in this system, overseeing a thorough approval process for all agricultural and veterinary chemicals. This process involves an assessment of the chemicals' safety for both people and the environment, potential impact on trade, and overall efficacy. A key aspect of this regulation is the setting of MRLs, which the APVMA defines as “the maximum concentration of a residue resulting from the registered use of an agricultural or veterinary chemical which is legally permitted or recognized as acceptable to be

present in or on a food, agricultural commodity or animal feed". These MRLs are established based on the approved use pattern when the product is applied in accordance with Good Agricultural Practice (GAP).

Australia's commitment to this rigorous, science-based evaluation system is further reinforced by the consistent monitoring undertaken through the National Residue Survey (NRS). The 2022-2023 NRS results, covering 7,024 grain samples, indicated a 99.52% compliance rate with domestic MRLs, underscoring the industry's adherence to high standards and GAP (Norwood, 2023). The primary concern arises when chemical residues are detected above these MRLs, as this can be an indicator of non-compliance with the registered product label.

Internationally, the setting of food safety and quality standards, including MRLs for pesticides, is largely overseen by the Codex Alimentarius. This body focuses on ensuring consumer health and promoting fair practices in global food trade. Efforts by organizations like CropLife International towards the global harmonization of MRLs are ongoing. However, challenges emerge, particularly with the European Union's approach to chemical regulation, which often prioritizes the intrinsic properties (hazard) of chemicals over a comprehensive risk-based assessment. This stance can create trade barriers, emphasising the importance for the Australian grains industry to encourage the Australian government's active engagement with CODEX. Such engagement aims to facilitate MRL harmonization and mitigate trade risks.

In Australia, the framework for grain standards is supported by a range of strict regulations and standards. Key players in this framework include the APVMA, Growing Australian Grain Stewardship, National Working Party on Grain Protection (NWPGP), Food Standards Australia, and various government inspection and certification bodies. The adherence to these standards, alongside compliance with the Australian Grain Code of Practice and the Export Control Act 2020, ensures the ongoing quality of Australian grain in both domestic and international markets.

Sustainability and environmental stewardship

Globally countries are in the pursuit of standardised sustainability measures, driven by the need to validate and demonstrate that grain production adheres to sustainable and ethical practices. This movement, crucial for maintaining access to key international markets like the European Union, aligns with broader environmental goals. The European Green Deal, introduced in 2019, epitomizes this shift, aiming to transform the EU into the first climate-neutral continent by 2050. This initiative dovetails with the United Nations' 17 Sustainable Development Goals, particularly through its 'Farm to Fork' strategy (Koundouri, *et al.,* 2021). This strategy seeks to revolutionise food systems, making them fairer, healthier, and more environmentally friendly. A central ambition of the 'Farm to Fork' strategy is to lead a global transition towards reduced reliance on pesticides, targeting a 50% reduction in pesticide usage by 2030.

In response to these global trends, the Australian grains industry has established the Australian Grains Industry Sustainability Framework, encompassing 12 goals focused on environmental stewardship, safety, wellbeing, and enhancing consumer confidence. This framework is supported by Sustainable Grain Australia, which has adopted the International Sustainability and Carbon Certification (ISCC) scheme, recognized globally for its stringent sustainability criteria. However, the Australian context presents unique challenges and opportunities. The industry's adoption of practices such as minimal tillage, stubble retention, controlled traffic, variable rate application, crop rotations, and IPM, positions it as a leader in sustainable farming, even considered radical by standards in regions like the Mid-West USA and the United Kingdom. This leadership presents Australian farmers with the opportunity to showcase their sustainable agriculture credentials to customers.

Nevertheless, the Australian grain industry faces the challenge of balancing the use of pesticides that underpin sustainable practices with the need to maintain grain prices and access to international

markets. This balancing act is pivotal, as it impacts both the industry's competitiveness and its alignment with evolving global sustainability standards.

Crop specific challenges and opportunities

In the Australian grains industry, evolving agronomic management practices are opening new avenues for distinguishing Australian grain in the international market. This differentiation has the potential to set Australian products apart from global competitors. For instance, mechanically desiccated (swathed) mung beans have the potential to command a premium, reflecting a market preference for certain production methods. Similarly, glyphosate-free sorghum is gaining traction, particularly in light of MRL exceedances noted in exports to Taiwan (Grain Trade Australia, 2021). Another example is sun-ripened oats, which are emerging as an alternative to glyphosate-desiccated oats, a practice more common in Canada (Grain Central, 2022).

There's also an increasing interest in reducing the use of paraquat in pulse crops such as lentils and lupins, providing a paraquat-free alternative to meet differing international standards. The misalignment of MRLs for paraquat between Australia (1.0 mg/kg) and the EU (0.02 mg/kg) underscores the need for such adjustments (European Commission, 2023; Australian Government, 2023). Major customers like Kellogg's and Nestlé are showing a growing demand for glyphosate-free grains, potentially leading to premium pricing (LaMotte, 2023, & Siegner, 2020).

However, these agronomic shifts come with their own set of challenges. Moving away from chemical desiccation or spray topping for weed seed control requires careful planning and execution. For example, avoiding glyphosate to even out grain sorghum maturity necessitates ensuring even emergence at planting. Likewise, omitting paraquat from weed seed control in lupins and lentils means that pre-plant and in-crop weed control must be more effective, or alternative methods for removing or destroying weed seeds at harvest need to be implemented. These changes in practice not only reflect market demands but also require adaptability and precision in agronomic management to maintain crop quality and yield.

The role of growers and future directions

- Enhance communication and consultation: It's important to continually improve communication and consultation within the industry. This effort helps in understanding market requirements and staying informed about consumer preferences
- Educate on market requirements: There should be a concerted effort to provide growers and agronomists with up-to-date information about market demands. This education is crucial for keeping pace with evolving consumer trends
- Adapt to consumer trends: Growers are encouraged to adapt to changing consumer preferences. This might include adopting new farming techniques, experimenting with different crops, or implementing more sustainable practices
- Focus on innovation: The industry should focus on innovation, not just to meet current market demands but to anticipate future trends. This proactive approach can help maintain Australia's position as a leader in the agricultural sector
- Collaborative effort for continuous learning: All stakeholders should engage in continuous learning and knowledge sharing. A collaborative approach is key to exploring and adopting innovative practices that align with market trends.

Conclusion

The Australian grain industry, facing the dual challenges of a growing global population and evolving market demands, must navigate a complex landscape of international trade regulations and consumer preferences. Key to this is the industry's commitment to responsible pesticide usage and adherence to product labels, ensuring market access. With increasing global focus on environmental

sustainability and reduced pesticide reliance, as highlighted by initiatives like the European Green Deal and consumer trends towards "chemical-free" products, Australian growers are positioned to adapt and innovate. This includes embracing technologies such as selective spraying and IPM, while also aligning with international sustainability standards.

Looking forward, the Australian grain industry's success hinges on effective communication, continuous learning, and adaptability to market shifts. As the industry responds to consumer demands for sustainable practices and navigates regulatory landscapes, it must balance these with the imperative of efficient food production. The role of Australian growers will be pivotal in this evolution, as they adjust agronomic practices and explore new market opportunities, ensuring the continued competitiveness and sustainability of the Australian grain industry in a dynamic global market.

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Date published

March 2024