House of Representatives Standing Committee on Agriculture: Inquiry into food security in Australia

Submission by Bayer Australia Ltd

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Table of Contents

Executive summary

As the world continues to adjust to the 'new normal' – amidst an ongoing pandemic, global supply chain disruptions, and geopolitical conflict – food security is increasingly at the forefront of public policy discussion. In Australia, our relatively uninterrupted access to fresh produce and staple foods has been challenged by the ongoing impacts of climate change on our domestic production. While we continue to enjoy relatively high levels of food security, the Australian government and broader agricultural industry must ensure we have the right policy settings in place to protect our yields against more extreme weather events and increased pest pressure. At the same time, we must also grow our industry productivity and encourage innovation to seek greater returns for producers and maintain our reputation as an exporter of safe, high-quality food.

Bayer's submission to the Inquiry on food security in Australia highlights the importance of science in how we've gotten to where we are today, as well as its role in our continued ability to feed ourselves and the world. Securing food supply will not get any easier – there is no new land to open up to cultivation, water resources are under continued pressure, and new pests and diseases will threaten our biosecurity as a result of climate change and international trade. Innovation will pave the way forward, but we must ensure that everyone has access. We offer recommendations to both modernise and harmonise our local regulatory and policy settings in gene technology and biosecurity, which would allow Australian growers access to world-class innovation while protecting our unique natural resources. In terms of strengthening local supply chains for critical inputs, Bayer's unique role in onshore formulation of breakthrough crop protection products helps mitigate the impacts of global disruption, and investment in local skills could build industry resilience and help farmers get what they need from a trusted source.

Australia can demonstrate global leadership to reduce trade barriers and support the flow of food to those who need it; we need to grow our farming toolbox – including through digital farming – rather than limiting access to safe and effective tools. We can also build on our reputation as a leading regional partner to support smallholder farmers in the Asia-Pacific region to access innovation, mitigate against climate change, and increase their local food supply. Bayer is committed to supporting smallholders and we're ready to partner with governments and organisations that share this dedication. We can continue to feed the world with our export produce, but we can also increase local capacity and shorten supply chains by ensuring that food is produced close to where it's consumed. This means prioritising access to innovation from both a regulatory and technical level, investing in extension to growers, and acting as a policy leader amongst our regional peers.

Following our submission, Bayer is ready to engage with government, industry, and stakeholders to share our insights and design a way forward for climate-smart agriculture that supports food security. Our simple proposition is that access to innovation is critical to achieving our vision – Health for All, Hunger for None.

Recommendations

Recommendation 1: Modernise the National Gene Technology Scheme to provide certainty to industry and growers

Recommendation 2: Better align phytosanitary seed testing with international standards to allow access to innovation

Recommendation 3: Prioritise building manufacturing, engineering, and construction skills to increase onshore manufacturing capacity

Recommendation 4: Invest in rural and regional transport infrastructure to increase efficiency and reduce freight costs

Recommendation 5: Demonstrate regional and global leadership on science-based regulation, through appropriate international fora, in the following areas:

Harmonising gene technology definitions and regulation

Adherence to World Trade Organisation rules on non-technical barriers to trade

Coordinating efforts with regional partner governments to ensure global sustainability goals are met without limiting regional agricultural productivity and access to innovation.

Recommendation 6: Prioritise partnering with importers to ensure plant biosecurity systems can respond to climate change-induced biosecurity threats

Recommendation 7: Increase investment in regional capacity-building projects, including through public-private partnerships

Introduction

Bayer is grateful for the opportunity to provide a submission to *Inquiry into food security in Australia.*

Bayer is a leader in agriculture in Australia and globally. We are a life science company with core competencies in agriculture and health. We develop our products and services to help people and planet thrive by supporting efforts to address the unprecedented global challenges presented by a growing population and climate change. Food is essential for health and nutrition, but every meal is the result of a journey that has recently become more challenging, as the food supply chain responds to unprecedented global and local market disruptions. Whilst Australia's food producing system is more resilient than many other nations around the world, we face our own challenges and responsibilities in climate change, limited natural resources, energy and input costs, and long supply chains.

About Bayer

As a leader in agriculture in Australia and globally, we provide solutions for Australian farmers to plant, grow and protect their harvests in the most efficient and sustainable way. Our Australian portfolio comprises crop protection, seeds and traits (including vegetable seeds), and digital farming solutions. We're unlocking opportunities to transform agriculture through a second-to-none innovation pipeline, pioneering decarbonisation in agriculture, leading digital tools to advance farming, and exploring new possibilities through partnerships. We heavily invest in developing new agricultural solutions and are committed to providing farmers with tailored solutions integrating critical tools to plant, grow and protect their harvests. Our local manufacturing presence also helps deliver stable supply chains in Australia and the Asia-Pacific (APAC) region by exporting crop protection products.

Disrupted supply chains, production shortfalls and resulting price increases are leaving households around the world vulnerable to food and nutrition insecurity. It is important to find solutions to avoid food shortages, prevent soaring prices and ensure supply chain recovery and stability, including the availability of seeds and agricultural inputs. At Bayer we take seriously our responsibility to help growers produce greater yields with fewer inputs by investing in new agricultural solutions. Climate change and its repercussions – water scarcity, extreme weather events, increased insect pressure – pose a growing threat to food security. With the benefit of enhanced weed and pest control, farmers have reduced their carbon emissions by spending less time on the tractor.

Building food security and resilience through innovation

With an annual investment of approximately €2 billion, ($3 billion AUD) Bayer is operating one of the largest research and development budgets in agriculture. Bayer is combining world-class chemistry, biology, biotechnology, and data science platforms into smart, digitally enabled solutions to be the partner of choice for farmers worldwide. We collaborate with researchers, start-ups and institutes through connections ranging from grants and technology licenses to collaborations, early-stage investments, and joint ventures through our impact investment unit 'Leaps by Bayer'. For example, we are prioritising early investment in biological fertilisers to boost productivity and reduce emissions from cropping systems. Besides commercial potential, we explicitly consider how projects in our innovation pipeline advance the sustainability of global agriculture. Our biotech pipeline includes RNAi, transgenic biotechnology for pest resistance and drought tolerance, and precision seed breeding. In crop protection, we are reducing the impact of our products by focusing on small molecules and increasing our portfolio of complementary biologicals.

Despite short-term market shocks from COVID-19, the agricultural input market is expected to grow on average 3 per cent annually over the next decade, driven by megatrends in population growth, demand for protein and pressures on harvests from climate change. Worldwide demand for food, feed and plant-derived fuel will continue to rise – and evolve – significantly over the coming decades. Securing a sufficient supply of quality food is just one side of the coin – agriculture needs to meet these growing demands by using natural resources more efficiently and responsibly.

At Bayer, our vision is *Health for All, Hunger for None.* We have a responsibility to work with governments and growers to advance science and innovation as the keys to unlocking a food-secure future. We recognise the role we play in helping farmers maintain productivity and profitability, but also in reducing the environmental impact of production to ensure Australia's agricultural industries can continue sustainable production into the future and underpin local, regional, and global food security.

Part 1: National production, consumption, and export of food

Supporting productivity in Australian agriculture

Bayer commends the Australian government on investigating food security within Australia. Not only is this critical for our own domestic supply, but Australia plays important supply role within our regional and global food chain. Australia enjoys a high level of food security because of continued government and private investment in research and development, natural resource management, water use efficiency, biosecurity, crop protection, biotechnology, and animal health and welfare. Australian growers, businesses, and consumers expect these policy settings and investment to continue. Our economic conditions and independent regulatory schemes provide certainty for farmers and the input companies that supply them; they also underpin our ability to export our produce.

Australian farmers are innovative and adaptive, with a focus on sustainable land management; our broadacre farmers are world-leading in integrating sustainable practices into their operations, including stubble retention, minimum tillage, and input optimisation.[1] Management practices such as no-till have only been made feasible through innovative crop protection to manage weeds, including glyphosate, first commercialised by Monsanto (now Bayer). While cropping (including broadacre, crop/pasture rotation, and horticulture) only uses about 7.5 per cent of Australia's agricultural land, it accounts for about 50 per cent of the value of Australian agricultural production. A decline in real farmgate prices over the past few decades, particularly for broadacre crops, has been offset by significant productivity gains through new technology and better management practices.[2]

Meeting global food demand to 2050 requires doubling global broadacre crop production, which requires a productivity (increase) rate of 2.4 per cent annually.[3] Australian broadacre productivity, adjusted for climate pressures (i.e. drought and floods), is approximately 1.2 per cent annually.[4] Our yield efficiency in wheat is relatively low in comparison to other wheat producing nations, and we share the world's largest yield gap with Kazakhstan.[5] As we are limited in our ability to increase yields through the expansion of arable land, higher rates of productivity will need to be driven through technology and innovation. Cultivar design, utilisation of genetic resources, advanced breeding, improved weed control, and improved crop and soil management are potential methods for closing the yield gap.[6][7] The

[1] Australian Bureau of Agricultural and Resource Economics and Sciences (2022) *Snapshot of Australian Agriculture 2022*, ABARES Insights, Canberra
[2] Ibid.
[3] Ray DK, Mueller ND, West PC, Foley JA (2013) *Yield Trends Are Insufficient to Double Global Crop Production by 2050.* PLoS ONE 8(6): e66428
[4] ABARES (2022)
[5] Senapati, N., Semenov, M.A., Halford, N.G. *et al.* (2022) *Global wheat production could benefit from closing the genetic yield gap*. Nat Food 3, 532–541
[6] Ibid.
[7] Monjardino, M., Hochman, Z. & Horan, H. (2019) *Yield potential determines Australian wheat growers' capacity to close yield gaps while mitigating economic risk.* Agron. Sustain. Dev. 39, 49

challenge of increasing output from efficient and sustainable cropping systems can only be met by investment in science and innovation.

Productivity gains to date have been driven by efficient use of natural resources and manufactured inputs, such as crop protection and biotechnology, and innovations in this sector will be critical to closing the yield gap in future. In 2015-16, about $20.6 billion of Australian agricultural value was attributable to the use of crop protection products (73 per cent of the total value of crop production).[8] Almost all horticulture production in Australia is underpinned by the use of synthetic or organic crop protection, with 100 per cent of the sector's value attributable to crop protection.[9] Some commodities (including onions, carrots and celery) could not be grown commercially in Australia without the use of fungicides.[10] As the global leader in crop science research and development, Bayer's innovative products have played a significant role in delivering this value and increasing Australia's productive capacity.

Bayer has also been at the forefront of driving Australian agricultural productivity through the introduction of commercial crop biotechnology. Between 1996 and 2016, the use of crop biotechnology increased Australian farm income by $1.37 billion.[11] While the only genetically modified (GM) crops available on the commercial market – cotton and canola – are not traditional food crops, they are part of the food chain through the manufacture of food-grade oil products (cotton seed oil and canola oil) and stockfeed for cattle (cotton seed meal and canola meal). The knowledge gained through developing GM cotton and canola is used in delivering trait innovation for other food crops both globally and for the Australian market; for example, GM wheat varieties are currently under investigation by Australian researchers. Advances in GM broadacre crops could not only increase yield through drought tolerance and pest resistance, but also reduce greenhouse gas and compound emissions from inputs and crop management.[12]

Bayer's horticultural products play an important role in supporting productivity, as well as limiting waste in the sector. Crop protection products can help reduce food waste in the fresh produce supply chain by increasing horticultural productivity and limiting pre-market destruction of produce. Bayer's Luna® Sensation fungicide targets in-crop diseases which also helps to increase shelf life and improve appearance of produce to meet retailer specifications. Targeted plant breeding can improve disease resistance, appearance, and hardiness to reduce loss. Our vegetable seeds are also bred for productivity; for example, Armaro tomatoes are highly disease-resistant; Strabena truss tomatoes hold fast to the vine, reducing requirements for plastic packaging; and Ranguru onions are bred for long shelf-life and reduced loss in packing and transportation.

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[8] Deloitte Access Economics (2018) *Economic activity attributable to crop protection products* Canberra, Australia
[9] Deloitte (2018)
[10] Ibid.
[11] Brookes G (2016) *Adoption and Impact of GM Crops in Australia: 20 years' experience*. Report prepared for CropLife Australia Ltd.
[12] Biden, S., Smyth, J. & Hudson, D. (2018) *The economic and environmental cost of delayed GM crop adoption: The case of Australia's GM canola moratorium*, GM Crops & Food, 9:1, 13-20

Protected growing environments have a critical role in meeting increased food demand by providing year-round affordable access to fresh fruits and vegetables using less land and resources. Protected cropping can achieve optimal growing conditions through greater control over light, temperature, moisture, pest and disease management, as well as greater efficiency of natural resources such as water, fertilisers, and crop protection products. The Bayer Vegetable Seeds team is working to introduce varieties that are more adapted to variable weather conditions that come with climate change.

We are introducing varieties with better pest and disease resistance to ensure growers can harvest their crops and meet the high-quality expectations of consumers. Our team is also investing heavily into protected cropping varieties as growers look to grow with more protection and retailers seek more reliability of supply. Focus areas for future vegetable seed innovations range from reduced losses along the supply chain to creating varieties more resilient to climate change. Protected cropping will be a key component of future food security for Australia as we look to strengthen supply for perishable product, and government could consider mechanisms to assist farmers in incorporating water- and energy-efficient on-farm infrastructure to protect crops under increased threat of adverse weather.

Areas for potential reform

The Australian government has available some opportunities for reform, including the ability to adequately assess risk and create a more innovation-friendly system through gene technology and seed import regulation, which will enable increased investment in advanced crop traits and grow horticultural industries through greater access to innovative seeds.

Delays in updating gene technology regulation as recommended in the Third Review of the National Gene Technology Scheme, and additional enhancements as requested by industry bodies, are causing uncertainty for the biotechnology industry and frustration for growers waiting to access new technologies. Implementing risk-tiering for GMOs, as recommended by the Review, would expedite 40 per cent of the contained release field trial licences and 67 per cent of the commercial release licences, reducing assessment times by 35 per cent.[13] This ultimately reduces time to market, reduces costs for innovation providers, and encourages investment in gene technology to address unmet market needs.

Further, definitions in gene technology regulation should be clear as to what is captured by the regulatory system for pre-market assessment, regulatory pathways should be aligned with those of our trading partners, and regulation of new products should be commensurate with actual risk. Australia should also demonstrate regional and global leadership on the

[13] Department of Health (2021) *Decision Regulation Impact Statement: Modernising and future-proofing the National Gene Technology Scheme*

regulation of plant breeding innovations to assist harmonisation with trading partners and safeguard market access for Australian growers.

Recommendation 1: Modernise the National Gene Technology Scheme to provide certainty to industry and growers

Regarding import regulation, departmental phytosanitary requirements for seed testing go beyond what is required in similar overseas markets and does not balance actual risk with Australia's appropriate level of protection. Vegetable seed destroyed through these processes is unusable, and loss of stock, as well as foregone sales, costs Bayer Australia approximately [redacted]. While Bayer supports departmental cost recovery to ensure the long-term funding of the biosecurity system, the department also has a responsibility to ensure costs reflect actual risk and do not act as a barrier to trade. Growers require access to imported seed to manage local supply fluctuations, as well as taking advantage of innovative genetics to manage disease and reduce crop loss.

Bayer supports the position of our peak industry body, the Australian Seed Federation, in seeking harmonisation of Australia's phytosanitary testing protocols with other National Plant Protection Organisations. This is not to reduce Australia's level of protection – we understand and support the crucial role of biosecurity in protecting our agricultural industries – but to ensure that technical requirements are aligned with commitment to market access.

Recommendation 2: Better align phytosanitary seed testing with international standards to allow access to innovation

An export-focused market supporting regional food security

Australian farmers are critical in supporting food security within our region; we export approximately 72 per cent of our agricultural produce.[14] Growers rely on consistent access to regional and global markets to maintain their profitability. On-farm profits from exported products are invested back into the local agricultural industry through research and development levies, driving sustainability and innovation. Our neighbours in the APAC region do not necessarily enjoy the same stability of government, investment, economy, or regulation. As a regional leader, it is important that the Australian government also considers how it can support food security in APAC – both through export of Australian produce, but also supporting regional farmers to access innovation, increase productivity, and provide food close to where it is needed.

[14] ABARES (2022)

The war in Ukraine demonstrates the food security impact of political instability on regional economies; Indonesia, for example, imports 30 per cent of its wheat from Russia and Ukraine, and geopolitical disruptions to this supply chain reduces food availability.[15] Food inflation, coupled with restricted access to agricultural technology, played a significant role in fuelling social and political disturbance in Sri Lanka, a net importer of food.[16] Trading partners with agronomic expertise and commitment to foreign aid and development can play a role in strengthening the food security of our neighbours, reducing economic and political instability in the region. Priorities for increasing regional food security are provided in more detail in part 3 of this submission.

[15] Eurasia Group (2022) *Food Security and the Coming Storm*. https://www.eurasiagroup.net/live-post/food-security
[16] Ibid.

Part 2: Access to key inputs and supply chain disruptions

Local formulation of inputs supporting local supply

As an input supplier to more than 80 markets around the world, Bayer has a highly developed and resilient supply network from research and development through to manufacturing and supply. Bayer is the only research and development-driven crop protection company formulating products onshore for Australian growers. Our crop science formulation plant is located at Pinkenba, approximately 10 km north-east of Brisbane. There are six separate manufacturing locations onsite, specialising in blending, formulating, and re-packing more than 90 different products. The Pinkenba facility formulates [redacted] Bayer-branded crop protection products sold into the Australian market [redacted] and exports [redacted] within APAC. Maintaining an onshore presence means that we can respond to changes in the local market; for example, multiple La Nina events have driven grower demand for crop disease control products during wet conditions, prompting us to respond [redacted]

[redacted]

Our investment in local formulation of crop protection products has provided an additional level of certainty to Australian growers through disruptions to international supply chains. It ensures they have access to the tools they need to keep producing through economic shocks or tough environmental conditions. At Bayer we have expanded our manufacturing footprint over the last two years as a demonstration of our commitment to the local

agricultural industry, even though onshore formulation may not always be the least-cost or most efficient option. Any further expansion of our manufacturing capability in Australia is limited primarily by the costs of operating in the local market. The cost base for labour in Australia is significantly higher compared to the rest of the APAC region, and there is a small pool of skilled labour. Geography also limits our capacity, particularly in servicing growers on the west coast who are logistically closer to formulation sites in Asia.

In upgrading the Pinkenba plant, Bayer has made a significant investment in equipment and installation. We engage local suppliers for some packaging, solvents, and raw materials, though accessing Australian-made plant equipment (e.g. formulation tanks) and skilled contractors for installation can be difficult. Reduced availability means that the cost of locally sourcing equipment and installation services is relatively higher than sourcing overseas product and labour for upgrade projects. The local manufacturing service sector is a diminishing market without critical mass in supply or throughput to justify costs. The wider Australian manufacturing sector and its supporting industries would benefit from building a critical mass in manufacturing, engineering, and construction skills, so that people are available when required by the sector and at a reasonable cost.

Recommendation 3: Prioritise building manufacturing, engineering, and construction skills to increase onshore manufacturing capacity

Regional road and rail infrastructure has been significantly impacted by flooding in 2022, adding cost to food distribution. To achieve the National Farmers' Federation 2030 goal of domestic freight cost per tonne-kilometre that is competitive with major agricultural exporting nations,[17] investment in repairs to damaged transport infrastructure must be prioritised. The critical case for government investment is two-fold – reducing costs to both producers and consumers, and protecting the quality of fresh produce to reduce food waste. For globally-connected agribusiness and ancillary services, it is important that Australia remains an attractive place to invest and move goods. Bayer notes Grain Growers' recommendations for improving freight planning, re-thinking models of infrastructure investment, and addressing regulatory impediments to more efficient freight for regional and rural Australia.[18]

Recommendation 4: Invest in rural and regional transport infrastructure to increase efficiency and reduce freight costs

[17] https://nff.org.au/2022-report-card/

[18] https://www.graingrowers.com.au/policy/freight-infrastructure-and-telecommunications/policy-position-australia-s-grain-freight-challenge

Our global supply chain

Most of Bayer's crop protection products are manufactured at our own production sites and we manufacture much of our own active ingredients, supplemented by external sourcing. Numerous decentralised formulation and filling sites around the globe enable us to respond quickly to the needs of local markets. The breeding, propagation, production and/or processing of seeds, including the application of seed treatment products, take place at locations close to our customers, either at our own facilities or under contract. Bayer sources our active ingredients primarily from our sites in Europe and the United States, with the remainder being sourced from numerous countries around the world, including our own plants in the APAC region. This arrangement allowed Bayer to maintain the resilience of our supply chain through the pandemic, but also allows flexibility for when alternative sourcing is required.

Bayer's supply chain, supported by regionalised in-house production and formulation, has demonstrated resilience through a number of interruptions, with little to no discernible impact on product supply for the Australian market. We have managed responses to global events including the pandemic, bushfires, hurricanes, snowstorms, flooding, port congestion, the Suez Canal blockage, container shortages, Nord Stream 1 leaks, and the war in Ukraine. Our plants have also been impacted by hurricane damage in Luling (USA) and an explosion in a supporting contract site in Dormagen (EU). Despite these disruptions, Bayer maintains strong supply chains and is confident we can manage supply and inventory to meet global demand.

Currently, [redacted] we are formulating products early to level out capacity. [redacted]
Access to local formulation at Pinkenba removes much of the volatility from the supply chain, but we are still exposed to domestic logistical issues caused by flooding. Finding space in the global shipping network remains difficult, as is sourcing pallets. These challenges are common across industries, and there is likely little that the Australian government could do to address international logistics pain points. Locally, we expect to be able to maintain supply in line with anticipated customer demand in 2023 [redacted]

Impacts of disruption in Europe

Bayer is more sensitive to supply chain interruptions in Europe than in other markets. Recent and rapid increases in freight costs, labour shortages, hyperinflation, and the conflict in Ukraine are now impacting our European supply chains. Businesses are experiencing increasing energy costs, higher prices of basic raw materials, and increased freight costs. This is impacting the overall cost of production, the cost to serve customers, and the timely availability of products. [redacted]

Manufacturing, trade, and competitiveness

As a global company with local formulation of products both on- and off-patent, Bayer has a unique view of the formulation environment in Australia, including risks to sector resilience. The relatively small size of the Australian crop protection manufacturing industry, and the significant cost differential between onshore and offshore manufacturing, is a key limitation on the industry's expansion. Australian formulation facilities are reliant on import of active ingredients, a significant majority of which are not manufactured onshore at any significant scale. Previous attempts to stimulate onshore formulation through grants were unsuccessful because of the very small number of companies with the capacity to scale-up output – start-up costs for new entrants are prohibitive. [redacted]

The supply of active ingredients to Australian formulators could be limited by a loss of some source markets. The European Commission has proposed a ban on exporting active ingredients for crop protection products where those ingredients have been deregistered for use in the EU.[19] In many cases, these ingredients would have been deemed safe to use by other regulatory authorities, including the Australian Pesticides and Veterinary Medicines Authority (APVMA).[20] This ban would have an impact on Bayer's ability to formulate some of our product locally, as we rely on imports of key ingredients from our sites in the EU; certain high-quality, effective crop protection products may no longer be available to the market if alternative sources for ingredients cannot be found. Australian formulators would be largely reliant on a potentially reduced selection of product supplier and likely increasing competition for a smaller pool of active ingredient, driving up costs,

[19] https://environment.ec.europa.eu/strategy/chemicals-strategy_en
[20] https://www.euractiv.com/section/agriculture-food/news/germany-to-stop-exporting-banned-pesticides-push-for-eu-wide-halt/

and increasing the vulnerability of the crop protection supply chain to political, economic, or other disruptions.

The active ingredient export ban is one of two key measures proposed by the EU as part of its Green Deal that may impact agricultural production in Australia. Bayer supports the aims of the Green Deal to decarbonise the European economy and provide international leadership on climate change, though decarbonisation will be difficult to achieve without global cooperation to manage externalities and reduce impacts on trading partners. There are some components of the Green Deal's Farm to Fork strategy that could limit the ability of Australia's export grains and horticulture industries to access crop protection products approved for use in Australia. Under the Farm to Fork Strategy, the EU has committed to considering environmental aspects when assessing requests for maximum residue limits (MRLs) for pesticide substances no longer approved in the EU. MRLs for active ingredients not registered in the EU will automatically default to 0.01 mg/kg in 2026, effectively removing those ingredients from use on Australian produce destined for the EU where this MRL cannot be met.

This has a direct impact on Australian growers, who use crop protection products as part of their toolbox to manage their unique seasonal and landscape conditions, dealing with pest and weed challenges that are different to their counterparts in Europe or other geographies. The canola industry is particularly exposed to changing requirements, with over 60 per cent of exports destined for the EU.[21] Reducing MRLs for the EU market is unlikely to lead to increased sustainability outcomes domestically – it is more likely to reduce productivity, restrict access to innovative crop protection products and technologies, and may increase emissions as growers manage pest and weed pressure with less effective products. Agricultural subsidies and barriers to trade lead to increased emissions and poorer food security outcomes by incentivising less efficient and sustainable production in the domestic market;[22] embedding similar expectations for exporting countries in MRL assessments externalises these impacts beyond the EU.

The APEC Cross Cutting Principles on Non-Tariff Measures, agreed to by APEC Ministers in 2018, asks countries to ensure that they do not:

- Arbitrarily or unjustifiably discriminate against imported products and ensure the unimpeded global trade of food as well as the stability of food supply chain
- Pose unwarranted, non-scientific and/or non-risk proportionate barriers to the development of new technologies that drive innovation.

[21] ABARES (2022)
[22] S Fell, J, Liangyue, C, Burns, K, Greenville, J (2022) *Emissions, agricultural support and food security*, ABARES Insights, Issue 6, Canberra

We believe the Australian government upholds these principles and ask that it continues global leadership through the World Trade Organisation and other fora to hold trading partners to account on abiding by the global rules-based trading order. Green diplomacy will not be limited to Europe – other economies in APAC are closely following EU-based models for influencing environmental regulation of trading partners. International advocacy is not only critical to ensuring Australian growers can continue to access important global markets, but also to promoting regional and global food security.

Recommendation 5: Demonstrate regional and global leadership on science-based regulation, through appropriate international fora, in the following areas:

- Harmonising gene technology definitions and regulation
- Adherence to World Trade Organisation rules on non-technical barriers to trade
- Coordinating efforts with regional partner governments to ensure global sustainability goals are met without limiting regional agricultural productivity and access to innovation.

Part 3: Climate change and food security

Global impacts of climate change pose an ongoing and serious threat to agricultural production, even to economies considered food secure. The average impact of climate change across Australian farms – without adjustment for technology or other adaptation measures – is an approximate 22.6 per cent decline in farm profits.[23] This figure is likely to be higher for broadacre farms that are more sensitive to climatic changes like decreased winter rainfall. Even under climate models that account for rapid reductions in global emissions, broadacre profitability is likely to decrease unless mitigated by adaptation.[24] Australian growers face a double challenge in safeguarding against potential losses and increasing yield productivity; this is likely to only be achievable with both plant breeding innovation to support more productive and drought-resistant cultivars coupled with crop protection products and technologies to safeguard increased yield.[25]

Ag tech as a climate-smart solution

Precision agriculture plays a critical role in helping growers adapt to climate change and produce more food with less – less land, less water, fewer inputs. Bayer's flagship product, Climate FieldView®, delivers data collection, visualisation, and analysis to help farmers optimise their operations, manage risk, address variability to increase harvests, and improve profitability. Launched in Australia in 2022, FieldView is the world's most connected digital farming platform, allowing growers to integrate homegrown Australian ag tech with powerful, global tools backed by Bayer and our partners.

Bayer sees FieldView and other digital farming products playing an important role in measurement and verification of on-farm emissions reduction through increased data capture for farmers. In markets where FieldView is well-established, such as the United States, Bayer offers payments through our Forground program to farmers adopting regenerative practices that sequester carbon, improve soil health, and reduce water use. Practice change is verifiable through FieldView data shared by the farmer with Bayer. We envision growers in Australia using this data to participate in carbon markets in Australia, and making use of private and public incentives for sustainable practices outside of carbon sequestration. Aggregate industry data collected by digital farming products will also help in supporting verification of industry sustainability frameworks.

Managing increased pest, weed and disease pressure

Climate change impacts will not be limited to decreased rainfall and lower soil moisture, and increased pressure from pests, weeds, and disease will necessitate innovate crop protection and biotechnology products to maintain yield. Higher temperatures are likely to

[23] ABARES (2022)
[24] Ibid.
[25] Monjardino et al (2019)

drive an expansion in the geographic range of agricultural pests, increase overwintering survival, increase number of generations, increase the risk of invasive species and insect-transmitted plant diseases, and change the relationship of pests to their hosts and natural enemies.[26] Temperate zones will be particularly susceptible to an increase in insect pest load, and subsequent crop losses particularly prevalent in broadacre crop species. Producers are also likely to face significant crop losses from weeds, which compete with crops at a similar trophic level for nutrient and water resources.[27] Crops like maize, sorghum and sugarcane (C4 plants) will face increased competition from C3 weeds that grow faster under increased atmospheric carbon dioxide concentrations.[28]

Projected increases in global crop yield through increased availability of arable land in areas previously too cold to grow crops is likely to be offset by an increase in plant pathogens, with both local diseases and those spread through international trade posing significant risks to productivity.[29] Globally, plant pests and pathogens contribute to crop losses of up to 30 per cent in the five major crops contributing to global calorie intake.[30] Crop losses from pests and diseases are generally lower in areas that produce food surplus and are higher and more variable in food-insecure regions, underlining the importance of food exports to support regional and global food security. Regions that have better plant health management practices, including through innovative crop protection, are less likely to experience crop loss and less likely to be food insecure.[31]

The Australian government can maintain vigilance against pests, weeds and disease through ensuring access to innovative crop protection, and continued investment in Australia's biosecurity system, particularly for plant health – and ensuring access to innovative crop protection tools. As discussed in part 1, regulatory systems need to keep pace with new technologies to ensure industry can mitigate the impacts of climate change on crop yields and increase the rate of productivity. Innovation in biosecurity surveillance and diagnostics will also assist the flow of trade and provide more certainty to importers that products will not be held at the border for long periods of time or require destruction prior to entry. Government should prioritise consultation with importing industries to ensure efforts accurately target risk and reduce unnecessary regulatory burden.

Recommendation 6: Prioritise partnering with importers to ensure plant biosecurity systems can respond to climate change-induced biosecurity threats

[26] Skendžić S., Zovko M., Živković I.P., Lešić V., Lemić D. (2021) *The Impact of Climate Change on Agricultural Insect Pests*. Insects. 12;12(5):440.
[27] Ramesh K., Matloob A., Aslam F., Florentine S.K., Chauhan B.S. (2017) *Weeds in a Changing Climate: Vulnerabilities, Consequences, and Implications for Future Weed Management*. Front. Plant Sci. 8:95.
[28] Ibid.
[29] Chaloner, T.M., Gurr, S.J. & Bebber, D.P. (2021) *Plant pathogen infection risk tracks global crop yields under climate change*. Nat. Clim. Chang. 11, 710–715
[30] Savary, S., Willocquet, L., Pethybridge, S.J. et al. (2019) *The global burden of pathogens and pests on major food crops*. Nat Ecol Evol 3, 430–439
[31] Ibid.

Supporting regional food security

Australia is in a unique position to provide support and leadership in APAC for four key outcomes. First, increased investment in the region will help meet commitments to the Sustainable Development Goals and enable a food-secure future for our neighbours. Second, Australia can mitigate the impact of increased pest and disease pressure in neighbouring countries and reduce the risk of new pests and diseases breaching Australia's borders. Third, ongoing regional leadership will open and maintain market access for Australian produce and ensure growers who use innovative agricultural technology are not shut out of the region due to incongruous regulatory systems. Finally, improving food security through aid and capacity building can help maintain regional geopolitical stability.

It is important that the Australian government demonstrates leadership in the region through maintaining, re-starting, or developing capacity building programs for smallholder agronomy, as smallholder farmers, each operating on a land size of less than two hectares, feed more than half the population across Asia. Building the capacity of regional governments in plant health, sanitary and phytosanitary standards, food standards, and assessment of crop technology (including chemistry and biotechnology) will also be critical in ensuring they can respond to increased productivity and innovation in their agricultural sectors.

Both these focus areas will require government-to-government cooperation as well as partnering for on-the-ground delivery. Companies like Bayer can assist through our networks and programs with smallholder farmers, local agronomists, charitable organisations, and other corporate partners. Globally, Bayer has a 2030 ambition to support 100 million smallholder farmers in low- and middle-income countries each year with products, services, and partnerships. We work with partners to provide access to our intellectual property, including data and germplasm, as well as to our products and agronomic know-how.

The *Business at OECD* Food & Agriculture Committee recently released a report exploring how the public and private sectors can work better together to build secure, sustainable, productive, and resilient global food systems that respond to a global 'triple challenge': ensuring food security and nutrition for a growing population, enabling livelihoods across the food chain, and sustaining the environment in the context of climate change. The medium-term priorities identified by the group provide a useful pathway for the Australian government to prioritise agricultural aid through public-private investment, highlighting the importance of technology, trade, and aligning digital tools with sustainability outcomes.[32]

[32] Business at OECD *Peace for Food Campaign Synthesis report* - Contribution to the 2022 OECD Meeting of Agriculture Ministers, October 2022

Building resilient agriculture in APAC

Access to innovation is one of the most significant enablers of driving productivity at every farm scale – not just for large producers – but smallholder farmers are limited in this access.[33] Agricultural innovation helps smallholder farmers manage risk, which will only increase as they experience climate change, and increasing total factor productivity for smallholder farmers will also contribute to food affordability for local consumers.[34] Intervention is required to address the decline of total factor productivity amongst low-income countries. The 2022 Global Agricultural Productivity Report calls for "urgent and vigorous action to accelerate productivity growth" by both governments and the private sector, noting that "progress is greater through partnerships."[35]

We recognise the commitment that the Australian government makes to investing in regional capacity building projects, as well as the opportunity to partner with aligned business, such as Bayer, to ensure on-the-ground delivery of extension. For instance, with our partners Netafim and the International Finance Corporation, Bayer operates over 2,300 Better Life Farming (BLF) centres across India, Bangladesh, and Indonesia, reaching over 600,000 smallholders. The BLF Centres:

- Encourage food security by providing access to high-quality agricultural inputs, such as seeds, crop protection products and drip irrigation technology, to help produce safe, nutritious and high-yielding crops
- Offer educational training to build capabilities, with certification programs that support financial stability through farm management, greater market access and successful entrepreneurship
- Promote sustainable farming methods, so smallholders are empowered to preserve the health of their fields and our planet.[36]

The BLF partners are seeking to deepen our footprint in the existing geographies with BLF Centres, with expansion of partnerships and reach within the communities. We will also seek to expand to new countries in APAC, focus on empowering women in agriculture, and strengthen our sustainability approaches across the value chain. Closer collaboration with the Australian Centre for International Agricultural Research, Researchers in Agriculture for International Development, and the Crawford Fund could increase opportunities for two-way knowledge exchange and upskilling. We acknowledge the significant support that the Australian government provides to PRISMA in Indonesia, which partners with BLF and other supply chain participants to increase incomes of smallholder farmers. We welcome any opportunity to discuss how we can replicate this successful partnership in other neighbouring markets.

[33] https://globalagriculturalproductivity.org/wp-content/uploads/2022/11/2022-GAP_Report_final_110922.pdf
[34] Ibid
[35] Ibid
[36] https://www.betterlifefarming.com/who-we-are/

Bayer also applies our expertise in health and nutrition, combined with our agronomic knowhow, to address hunger and food security in APAC. In 2020, Bayer Indonesia launched Bayer untuk Indonesia (BISA) program. Through BISA, we are increasing the knowledge of smallholder farmers and introducing agricultural technology and solutions to increase productivity and protect the environment. We also provide farmers' families with education and training on women's health, family planning, nutrition, self-care, and stunting prevention. This has led to a 20 per cent increase in agricultural productivity and a 30 per cent increase in farming incomes, as well as educating 100 healthcare professionals and over 30,000 women. By partnering with actors along the value chain in an inclusive closed-loop business model, we can develop a village-based business ecosystem that empowers smallholder farmers and their families. Increasing women's economic participation through education will also ensure they can play a key role in building regional food security.

Recommendation 7: Increase investment in regional capacity-building projects, including through public-private partnerships

Conclusion

Thank you for the opportunity to outline Bayer's commitment to supporting food security in Australia and the APAC region. Food security is increasingly at the forefront of global discussions within our organisation and with our stakeholders. Australia's agricultural sector, and its partners in the value chain, have a significant challenge ahead in meeting local and global demand for food. We cannot simply continue with the current pace of change; governments, businesses, and researchers must prioritise those game-changing innovations that will overcome yield gaps, reduce impact on natural resources, and ensure future sustainability of food systems.

We cannot meet this challenge without making research and development accessible to everyone. Regulatory schemes and policy settings should encourage innovation, opening doors to global scientific breakthroughs while protecting Australia's unique and highly productive farming systems, as well as human and environmental health. The sector's export capacity should be protected, in order to grow the prosperity of our regional, rural, and remote communities. Farmers need access to safe and effective crop protection, gene technology, and digital tools that make sense for their operations, and contribute to sustainable pest, weed, and disease management. Australian agriculture has been built on the adoption of innovation – to keep the world fed in the future, we need access to a wider range of tools, rather than narrowing down safe farm management options.

Bayer looks forward to continuing to engage with the committee on the future of food security in Australia and our region.