CropLife Australia

June 2025

Productivity Commission 5 Pillars Inquiries

- **Creating a more dynamic and resilient economy**

- **Investing in cheaper, cleaner energy and the net zero transformation**

1 INTRODUCTION

CropLife Australia (CropLife) is the national peak industry organisation representing the agricultural chemical and plant biotechnology (plant science) sector in Australia. CropLife represents the innovators, developers, manufacturers, formulators and suppliers of crop protection products (organic, synthetic and biological based pesticides) and agricultural biotechnology innovations. CropLife's membership is made up of both large and small, patent holding and generic, Australian and international companies. Accordingly, CropLife advocates for policy positions that deliver whole of industry and national benefit. However, our focus is specifically on sustainable environmental land management and an Australian farming sector that is internationally competitive through globally leading productivity and sustainability practices. Both of which are achieved through access to world-class technological innovation and products of the plant science sector.

The plant science industry contributes to the nation's agricultural productivity, environmental sustainability and food security through innovation in plant breeding and pesticides that protect crops against pests, weeds and disease. More than $31 billion of the value of Australia's agricultural production is directly attributable to the responsible use of crop protection products, while the plant science industry itself directly employs thousands of people across the country.[1] CropLife Australia is a member of CropLife Asia and part of the CropLife International Federation of 91 CropLife national associations globally.

CropLife welcomes the Australian Government's commitment to prioritising reforms that will underpin ambitious productivity growth and support raising living standards across the Australian community. While Australian agriculture has demonstrated long term productivity growth that outstrips the market sector, creating resilient productivity growth in the industry must continue to be a focus of Government policy. This is necessary not only to protect and grow agriculture as an important source of export revenue but also to underpin the production of fresh produce necessary to curb cost of living pressures faced by Australian families.

Australian agriculture continues to be an important source of export revenue in the economy, contributing over ten per cent of exports of goods and services in 2023-24;[2] however, productivity growth across the sector faces headwinds created by climate change

[1] Deloitte Access Economics, 'Economic Contribution of Crop Protection Products in Australia', August 2023, https://www.croplife.org.au/resources/reports/economic-contribution-of-crop-protection-products-in-australia/.

[2] ABARES, "Snapshot of Australian Agriculture 2025" (ABARES Insights, Issue 1 February 2025) DOI: https://doi.org/10.25814/gs4g-ys39.

and restrictions on new technologies.[3] Price rises in fruit and vegetables as reported by the ABS has led food inflation for the ten months of FY2024-25.[4] This inflation, which reflects the tightness of supply and demand for fresh produce in Australia, erodes the purchasing power of real wages across the economy. Productivity growth across Australia's horticultural commodities is important to curbing the impact of food inflation on household budgets while returning fair reward to our nation's farmers.

CropLife appreciates the opportunity to comment on the Productivity Commission's inquiries to identify and report on priority reforms in each of the areas under the Government's five pillar productivity growth agenda. Specifically, CropLife seeks to make a submission in response to the following questions:

- Pillar 1 – Creating a dynamic and resilient economy:
    - Reduce the impact of regulation on business dynamism
- Pillar 5 – Investing in cheaper, cleaner energy and the net zero transformation:
    - Reduce the cost of meeting carbon targets

[3] W Chancellor and C Boult, "Australia's farm productivity slowdown – why it matters, and what it means for policy makers", (ABARES Insights, Issue 2, July 2024) DOI: https://doi.org/10.25814/dcvj-7934.

[4] ABS, "Monthly Consumer Price Index Indicator" https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/monthly-consumer-price-index-indicator.

2 PILLAR 1 - CREATING A MORE DYNAMIC AND RESILIENT ECONOMY

2.1 Reduce the impact of regulation on business dynamism

2.1.1 Regulation of Crop Protection Products and Gene Technology

Australia has established science-based regulatory frameworks that underpin the commercialisation and use of plant science innovations by the Australian agricultural sector.

- The Australian Pesticides and Veterinary Medicines Authority (APVMA) regulates agricultural and veterinary chemicals under the National Registration Scheme established by the *Agricultural and Veterinary Chemicals Code Act 1994* (Agvet Code).
- The Gene Technology Regulator, with the assistance of the Office of the Gene Technology Regulator (OGTR), regulates Genetically Modified Organisms, including GM crops under the *Gene Technology Act 2000.*

The science-based regulatory schemes Australia has implemented for these technologies has created frameworks that facilitate the benefits they provide to the Australian agricultural sector while preventing harm and promoting community trust. In doing so, the regulatory arrangements have created pathways that support the commercial investment required to bring new technologies and innovation to Australian farmers.

While the use of these products in the Australian farming system have undeniably contributed towards enhancing the dynamic and resilient nature of our agricultural industry, structural impediments impede the full technological opportunity they offer to our farmers. Specifically, because the Australian market for these products is relatively small, innovator companies face a greater risk of being unable to recoup a return commensurate with their substantial, lengthy investment in R&D and commercialisation.[5] These factors lead to delays in bringing new products to the Australian market compared to other jurisdictions and/or a limited commercialisation of the technology's full potential (eg a partial registration of a crop protection product that does not provide access to minor commodities).

As such, it is imperative that the necessary high standards of scientific risk-based protection these regulatory systems provide is delivered in a cost-effective, efficient, predictable and

[5] Mandala, "An Australian patent credit system: Boosting investment and innovation in agriculture" (report, 30 June 2023). See also AgbioInvestor, "Time and Cost of New Agrochemical Product Discovery, Development and Registration (report, February 2024) and AgbioInvestor, "Time and Cost to Develop a New GM Trait (report, April 2022).

responsive manner.[6] This is necessary to enable global and domestic businesses to confidently assess the commercial feasibility of investments required for regulatory approval and commercialisation in the Australian market. Reforms to Australia's intellectual property settings that compensate innovators for time lost in market while undergoing mandatory pre-market assessment will further support the commercial feasibility of bringing new technology to Australian farmers.

Crop protection products

Agricultural chemicals (commonly known as pesticides or crop protection products) play an important role in driving on-farm productivity in Australian agriculture. Deloitte Access Economics identified that $31 billion of the value of Australia's agricultural production, or 73 per cent of the total value of crop production in 2020-21, was directly attributable to the use of crop protection products.[7]

Importantly, the technologies embedded within these crop protection products have also enabled farmers to implement practice change innovation; most observable in the broadscale adoption of no-tillage and minimum-tillage farming across the Australian broadacre cropping sector.[8] This farming practice, which is enabled by the use of herbicide weed control over summer fallow periods, has increased the productivity of Australian farmers in the face of climate change by improving water use efficiency and declining yield sensitivity to drought conditions.[9] The Grains Research and Development Corporation's Water Use Efficiency Initiative identified the use of herbicides during summer fallow resulted in an average 60 per cent increase in seasonal water use efficiency and returned farmers on average $5.60 for every dollar they invested in weed control.[10]

[6] Agricultural and Veterinary Chemicals Code Act 1994, Schedule – Agricultural and Veterinary Chemicals Code, s.1A.

[7] Deloitte Access Economics, 'Economic Contribution of Crop Protection Products in Australia', August 2023, https://www.croplife.org.au/resources/reports/economic-contribution-of-crop-protection-products-in-australia/.

[8] A Read, J Rollan, C Creed and James Fell, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons', (ABARES Insights, Issue 2, July 2023), DOI: https://doi.org/10.25814/zzdq-4t23.

[9] Neal Hughes, Kenton Lawson, and Haydn Valle, 'Farm Performance and Climate: Climate-Adjusted Productivity for Broadacre Cropping Farms' (Department of Agriculture and Water Resources, ABARES, May 2017), https://www.agriculture.gov.au/abares/research-topics/climate/farm-performance-climate.

[10] Grains Research & Development Corporation, 'Water Use Efficiency Research Is Transforming the Productivity Potential of Australian Farming Systems, Demonstrating That Efficiency Gains of 20-40 per Cent Are Possible with Optimal Pre-Crop and in-Crop Management Practices', n.d., https://grdc.com.au/about/rde-investment-strategy/delivering-impact/investing-in-water-use-efficiency-yields-results.

Cost shifting public good activities onto the private sector

The APVMA is the only pesticide regulator in the OECD entirely funded by industry fees and levies. This full cost recovery model, combined with Australia's relatively small market, discourages global innovators from registering new, productivity-enhancing technologies for Australian farmers. The result is an undermining of the agricultural sector's international competitiveness.

This funding structure limits the National Registration Scheme's ability to deliver on the public policy objectives set out in Section 1A of the Agvet Code, which prioritise farmer access to safe and effective agricultural innovations through an efficient regulatory system.

Moreover, full cost recovery has led to misplaced public concerns that the APVMA lacks independence from industry. While the system provides no actual scope for undue influence, introducing a public funding component—aligned with other regulators—would strengthen public confidence in the APVMA's integrity.

CropLife recommends that the Government fund the APVMA's public benefit functions in line with its own cost recovery guidelines. According to the Department of Agriculture, Fisheries and Forestry, an additional $8.4 million annually would fully support the APVMA's public good functions, including compliance, enforcement, and chemical reconsideration.

Other regulators already receive public funding:

- The Office of the Gene Technology Regulator (OGTR) receives over $8 million annually via appropriation.
- The Therapeutic Goods Administration (TGA) receives $15 million annually to support its public good activities.

Comprehensive public funding would also reduce barriers for smaller registrants, support innovation for minor crops and niche industries, and help meet the broader public objectives of the regulatory framework.

Changes to the assessment of the Agvet Code's Efficacy Criteria

The Efficacy Criteria, established under section 5B of the Agvet Code, is the most subjective of the statutory criteria for registration of crop protection products. Guidance produced by the APVMA focuses on the binary question of whether a chemical product can, to a reasonable degree, achieve one of the effects listed in paragraphs 4(2)(a) to (e) of the Agvet Code. This assessment is not intended to serve as a guarantee of commercial performance but plays a critical role in setting use rates and patterns, underpinning the assessments required under the safety and trade criteria.

The efficacy criteria need not duplicate obligations registrants hold to farmers and other users under the Australian Consumer Law that a product will perform in accordance with the manufacturer's description.

Registrants of crop protection products have identified an increasing tendency by the APVMA to treat efficacy as a matter of internal scientific certainty or statistical purity, disconnected from its role in a broader regulatory decision. This is misguided. Field conditions are inherently variable; product performance will always depend on the user's judgment, agronomic practices, and local conditions. Therefore, the regulator's role is not to guarantee consistent effectiveness under all conditions, but to determine whether the exposures approved (via label instructions) are justified by a scientifically credible likelihood of benefit under reasonable use.

This escalating and unpredictable situation has affected the registration of fungicides, insecticides and herbicides. Among CropLife Australia members alone, **at least 50 applications have gone overtime or have had to be withdrawn** in the past year as a result of these new and completely unwarranted demands for efficacy data. Delays of three to four months are common (reported for over 20 applications), with a few even exceeding one year and at least one application experiencing a 16-month delay.

The current state of overdue and delayed applications not only poses a serious threat to Australia's farming productivity but also impedes our nation's ability to properly prepare and respond to a range of potentially catastrophic biosecurity threats. As such, it is our view that this matter be escalated substantially to ensure it is addressed as a matter of urgency.

These changes have occurred despite there has been no change to the regulation or to guidance material to have caused these delays or led to the current level of unnecessary bureaucratic requests and decisions being made by officers of the APVMA.

Intellectual property (IP) – Patent extension and data protection enhancements

A patent system that recognises the specific commercial realities of Australia's plant science sector is essential. Patent term extensions and enhanced data protection are practical, internationally validated mechanisms to address market thinness and regulatory-induced delays.[11]

[11] OECD (2014), Guidance Document on Regulatory Incentives for the Registration of Pesticide Minor Uses, Series on Pesticides and Biocides, No. 63, OECD Publishing, Paris, https://doi.org/10.1787/9789264221710-en.

Australia's agricultural innovation ecosystem depends on timely access to new technologies that improve productivity, sustainability, and resilience in food and fibre production. However, the structure of Australia's intellectual property (IP) system does not adequately account for the realities of bringing agricultural chemical and crop biotechnology products to market in a small and highly regulated jurisdiction.

Patent term extensions and enhanced data protection provisions are essential reforms to ensure that the Australian market remains attractive to global innovators and that farmers retain access to the tools they need to remain internationally competitive. Their adoption would increase the likelihood of timely product launches and support greater investment by companies developing transformational technologies that will support productivity growth in the agricultural industry.[12] In doing so, an Australian patent credit scheme would work to prevent the high opportunity costs of foregone production currently borne by Australian farmers when crop protection products available elsewhere in the world do not have specific permitted uses in Australia.[13]

The plant science sector is subject to mandatory, rigorous, and science-based regulatory approval processes administered by the APVMA and the OGTR. These processes, while essential for ensuring safety and efficacy, can span multiple years, during which time patent-protected technologies are denied access to the market.

Unlike other sectors, this pre-market barrier results in the real erosion of patent value. During the regulatory review period, patent time continues to lapse, but the innovator is prevented from generating any commercial return. This reduces the effective patent life and undermines the incentive to invest in Australia-specific research and development (R&D).

In recognition of this issue, many jurisdictions, including as the United States of America, European Union, and Japan, have implemented patent term extension mechanisms to compensate innovators for time lost during the regulatory approval process. These provisions apply not only to human pharmaceuticals but, in several cases, also extend to regulated agricultural products.

Australia's IP framework; however, offers such extensions only for pharmaceutical patents under section 70 of the *Patents Act 1990*, despite agricultural and biotech products

[12] See W Chancellor and C Boult, "Australia's farm productivity slowdown – why it matters, and what it means for policy makers", (ABARES Insights, Issue 2, July 2024) DOI: https://doi.org/10.25814/dcvj-7934.

[13] See Grain Producers Australia, preliminary submission to the Independent Review of the Pesticides and Veterinary – Medicines Regulatory System in Australia, Issues paper review of the agvet chemicals regulatory system Future reform opportunities, February 2020.

undergoing similarly intensive regulatory scrutiny. This inconsistency disadvantages the plant science industry. It discourages the Australian launch of new technologies, reduces R&D investment, and creates a market environment less favourable to innovation compared to international peers.[14]

In particular, the development of an Australian patent credit scheme for plant science technologies would complement the "springboarding reforms" introduced by the 2012 *Raising the Bar reforms*. It would do this by supporting the commercial feasibility of bringing new and transformative technologies to market, while still facilitating generic competition at the conclusion of the protected patent period.

Australia represents a small share of the global agricultural technology market. The cost of regulatory compliance in this environment makes Australia a low priority for product development and commercialisation, especially when coupled with uncompensated patent erosion. This is particularly acute for minor uses and specialty crops, which are already under-served.

The absence of patent term extension for highly regulated crop protection products presents a structural disincentive to investment. The result is a thinning innovation pipeline, delayed or forgone product launches, and reduced access to technologies that support productivity, environmental outcomes, and food security.

Documents appended:

- Deloitte Access Economics, 'Economic Contribution of Crop Protection Products in Australia', August 2023.
- Mandala, "An Australian patent credit system: Boosting investment and innovation in agriculture" (report, 30 June 2023).

Gene Technology

Over the period 1996-2015, PG Economics calculated that the use of genetic modification in cotton and canola production had increased farm income by $1.37 billion.[15] Farmers would have been required to plant an additional 350,000 hectares of conventionally bred cotton and canola over the same period to achieve the extra productivity gained by the use of genetically modified crops.[16] The value of crops bred using gene technology will only grow more important under climate change scenarios, characterised by hotter and drier

[14] Mandala, "An Australian patent credit system: Boosting investment and innovation in agriculture" (report, 30 June 2023).
[15] Graham Brookes, 'Adoption and impact of genetically modified (GM) crops in Australia: 20 years experience', May 2016.
[16] Ibid.

production environments. A climate change risk assessment undertaken by the Commonwealth Bank in 2019 identified that biotechnologies, such as GM, can increase the climate resilience of crops, including pasture crops, by up to 40 per cent over the next 40 years.[17]

National Gene Technology Scheme

While historically Australia had been a global leader in the regulation of gene technologies, commercial uncertainty caused by delays in implementing the recommendations of the Third Review of the National Gene Technology Scheme has seen Australia's standing decline.

The Third Review of the National Gene Technology Scheme commenced in 2017 but over seven years later, the recommendations made by the review remain unimplemented. In October 2018, the Legislative and Governance Forum on Gene Technology met to endorse the Third Review and its 27 recommendations. However, the implementation delay has left the Scheme lagging in numerous areas of accumulated scientific evidence, undermining Australia's global reputation as a leader in agricultural innovation and biotechnology investment. This stagnation has had a chilling effect on R&D investment and has delayed the introduction of advanced biotechnologies essential for the agricultural sector's sustainability and growth.

Australia needs to take urgent action to avoid being left behind. The protracted and unresolved regulatory review process has dramatically undermined the confidence required by members of the plant science industry to commercially invest in Australia. Because the regulatory framework also underpins other biotechnology applications, the delay has also stalled the growth to our broader bioeconomy. At the same time other jurisdictions across the world have updated their gene technology regulatory frameworks to better reflect the settled science of the safety of biotechnology. This has resulted in farmers, and other bioeconomy stakeholders, in these jurisdictions having access to new technologies not available in Australia, impacting our international competitiveness.

Progress towards implementation has been made by the Department of Health and Aged Care (DHAC) in the past 12 months, including the release of the draft Gene Technology Bill. However, the lack of certainty on when the reform process will be complete leaves industry without the certainty necessary to plan for the investment needed to support R&D and commercialisation. By comparison, the New Zealand Government has recently released its

[17] 2019 Annual Report' (CommBank, 2019), https://www.commbank.com.au/about-us/investors/annual-reports/annual-report-2019.html.

Gene Technology Bill to establish an entirely new regulatory scheme for gene technology in a little over 12-months. This Bill will incorporate the recommendations made as part of the Australian Third Review of the National Gene Technology Scheme.

The amendments to the National Gene Technology Scheme provided by the Australian Gene Technology Bill remain modest. While the introduction of risk tiering is an important step forward, the scheme will not adequately provide Australia with a future-proofed regulatory framework. Although the continuation of process-based triggers, as opposed to an outcomes-based system, needlessly burdens innovators, this was agreed upon in the review. However, as it stands the amendments will not adequately implement all the agreed recommendations. Furthermore, the definitions governing the organisms under the framework remain overly restrictive, limiting innovation and the integration of emerging technologies.

Food regulation

Commencing in June 2017 and with the final report being published December 2019, FSANZ undertook a review of food derived using new breeding techniques (NBTs). Subsequently, proposal P1055 was commenced by FSANZ to amend definitions of food produced using gene technology in the Australia New Zealand Food Standards Code (the Code). With the recent completion of the proposal P1055 public consultation, it is critical that these amendments to the Code be finalised as soon as possible.

CropLife supports updates to the Code that result in foods being regulated in a manner proportionate to the risk they pose. The recognition that NBT foods have the same characteristics as conventional foods and therefore should be regulated in the same manner as conventionally produced food is welcomed. This is consistent with current scientific knowledge and understanding, as elaborated in FSANZ's detailed safety assessment of NBTs. Furthermore, this approach is in line with progressive approaches being implemented in other international jurisdictions.

As noted in CropLife's submission to the second P1055 call for comment, the proposed definition amendments are a significant step towards a science-based regulatory system but still fall short in the development of a risk-proportionate outcome-based system. The proposed definitions potentially regulate food as GM even if they are indistinguishable from those developed through conventional breeding. This includes the classifying intragenesis as GM, despite its similarity to naturally occurring processes.

An outcome-based, rather than process-based, risk-proportionate regulatory approach ensures Australian consumers benefit from biotechnology innovations by having rapid access to food that is potentially both cheaper and better for the environment.

Furthermore, continued delays in updating the code are having a chilling effect on innovation and investment in the bioeconomy. With the rapid global expansion of NBT-related products, many of our largest trading partners are leaping ahead by introducing modernised regulatory frameworks.

CropLife would like to acknowledge the considerable body of work undertaken as part of P1055 with respect to the analysis and summary of stakeholder concerns and the relevant scientific literature that relates to the proposed changes.

CropLife recommends that sufficient resourcing and support is provided to FSANZ to ensure the timely completion of P1055 in a manner consistent with science-based regulatory practices. This will provide industry with the certainty necessary to introduce additional products to the comparably small Australian market and thus provide access to Australian consumers.

Reducing Regulatory Duplication

Regulatory duplication can significantly delay the commercialisation of cutting-edge technologies and create additional administrative burdens for innovators. When multiple agencies assess the same product or process, overlapping requirements and inconsistent timelines increase costs and uncertainties. This, in turn, can discourage investment in Australian R&D and slow the delivery of potential benefits—whether in agriculture, medicine, or the broader economy. CropLife supports efforts to reduce regulatory duplication through improved coordination between regulators.

An excellent recent example of effective inter-agency collaboration is the simultaneous assessment of a GM banana developed for resistance to Fusarium wilt tropical race 4 by the Queensland University of Technology.[18] The OGTR and FSANZ worked in tandem to review the GM banana, streamlining data requests and coordinating approvals. This alignment not only reduced duplication of effort but also provided greater certainty for the project's proponents. By receiving timely, coordinated feedback, researchers and investors were better able to manage resources and prepare for eventual commercialisation. Such collaboration could also be expanded to other regulatory agencies. For example, between the APVMA and OGTR. This is critical for GM crop varieties with herbicide resistance traits—a space that has seen significant delays.

[18] See, eg, Office of the Gene Technology Regulator, 'DIR 199:Commercial release of banana genetically modified for resistance to Fusarium wilt tropical race 4 (TR4)' (Website, Accessed March 2025) <https://www.ogtr.gov.au/gmo-dealings/dealings-involving-intentional-release/dir-199>.

This kind of inter-agency cooperation should be the norm rather than the exception. When agencies proactively share information, standardise protocols, and synchronise review timelines, Australia's regulatory frameworks become more transparent and efficient. This fosters an environment that attracts global innovators, secures funding for local research projects, and brings novel technologies and products to market sooner—without compromising safety or integrity. By prioritising cohesive, science-based regulatory approaches, Australia can strengthen its leadership in agricultural, environmental, and medical innovation.

2.1.2 Extended Producer Responsibility

CropLife Australia supports high regulatory standards that achieve measurable environmental and economic outcomes. However, the regulatory framework must also enable commercial predictability and support private sector investment if it is to contribute meaningfully to a dynamic and resilient economy.

Extended Producer Responsibility (EPR) schemes, when poorly designed, risk embedding structural inefficiencies and inflationary costs into supply chains. This is particularly evident where regulation mandates a single provider or prescribes centralised delivery models that limit flexibility, stifle innovation, and crowd out more cost-effective, industry-led approaches.

CropLife and its members have a proven record of delivering effective national product stewardship through programs such as drumMUSTER® and bagMUSTER®. These industry-led schemes demonstrate that high regulatory outcomes, such as reduced environmental impact and circularity in packaging stewardship, can be achieved efficiently when regulatory settings are:

- Outcome-focused, not input-prescriptive.
- Competitively neutral, allowing multiple providers to delivery stewardship outcomes.
- Commercially predictable, providing confidence for long-term investment e.g., recycling infrastructure.
- Science-based and risk-proportionate regulation to ensure actual risks are mitigated and also enabling dynamic adaptation.

Embedding overly rigid or monopolistic EPR models into regulation risks undermining this investment confidence. It bakes in fixed compliance costs, increases inflationary pressure, and discourages innovation in packaging design, recovery logistics, and data systems—each of which are critical to achieving circular economy outcomes.

CASE STUDY – APCO

One such example is the EPR scheme currently being developed by the Australian Packaging Covenant Organisation (APCO). While APCO provides services that are essential to the current co-regulatory scheme for packaging stewardship, it has consistently failed to meet national targets despite decades of data collection.

Its centralised approach, lack of accountability to participating businesses and government, and its historical unwillingness to embrace successful industry stewardship schemes make it ill-suited to lead the next generation of packaging reform. More critically, APCO's model imposes non-transparent, non-contestable cost structures on businesses. Such an approach is inherently inflationary and incompatible with the need for regulatory systems that promote efficiency and resilience and deliver outcomes for Australians and our natural environment.

The Government's national reform of packaging regulation and stewardship must take these structural concerns seriously. Embedding a single, underperforming body into regulatory design risks entrenching inefficiencies, undermining public trust, and deterring commercial investment in packaging innovation and recovery. Instead, the reform process must ensure that the regulatory architecture promotes competition, enables multiple fit-for-purpose stewardship providers, and maintains flexibility for industry-led investment in circular economy outcomes.

To support economic dynamism, regulation must therefore evolve beyond compliance enforcement and become a framework that actively encourages private investment in public outcomes. A well-calibrated regulatory system provides the certainty needed for businesses to invest, while retaining the flexibility for market-led solutions to emerge and succeed.

3 PILLAR 5 INVESTING IN CHEAPER, CLEANER ENERGY AND THE NET ZERO TRANSFORMATION

3.1. Are there gaps in the emissions-reduction policies in the industrial, electricity and transport sectors which should be addressed?

Expanding the role of Low Carbon Liquid Fuels (LCLF) provides a key opportunity to decarbonise Australia's economy. Moreover, the domestic production of LCLFs presents opportunities to the Australian economy beyond the role it will play in lowering emissions in hard to abate industries, such as transport and logistics. In particular, the production of LCLF will see the development of domestic manufacturing focused around adding value to the existing strengths of Australia's primary production capacities.

Although there is considerable policy work on the LCLF sector, feedstock production has received scant attention. A sustainable and commercially viable Australian LCLF industry depends on secure access to low-emissions feedstock. The consultation paper does recognise the importance of efficient crop production to this aim, but beyond advocating consistent demand for feedstock crops, it neglects the policy measures needed to guarantee supply. Any policy response must also heed global concerns that low-carbon biofuels are confronting a feedstock crisis and growing scrutiny over competing uses of arable land for food versus fuel.[19]

Feedstock production depends on Australian farmers. However, our primary producers face uncertain times. They are at the rockface of climate change while also contributing to the range expansion of invasive pests, weeds and disease. They need access to every possible tool available.

This primarily includes access to inputs, most notably Crop Protection Products (CPPs). More than $31 billion of the value of Australia's agricultural production, or 74 percent, is directly attributable to the responsible use of CPPs. Herbicide use in particular has underpinned the widespread adoption of no-till farming in Australia. Consequently, Australian farmers are world leaders in the adoption of no-till practices.[20] These no-till practices preserve soil structure, reduce erosion and maintain crop residues as a protective cover. This cover conserves moisture, fosters microbial activity and contributes to carbon

[19] International Energy Agency, 'Renewables 2022' (2022 IEA Report) 'https://www.iea.org/reports/is-the-biofuel-industry-approaching-a-feedstock-crunch'

[20] A Read, J Rollan, C Creed and James Fell, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons', (ABARES Insights, Issue 2, July 2023), DOI: https://doi.org/10.25814/zzdq-4t23.

sequestration, aligning with efforts for carbon neutrality and climate change mitigation in Australian agriculture. Across the Australian crop production landscape, the high adoption of no-tillage practices over the 1990s and 2000s resulted in the sequestration of approximately 5 million tonnes CO2~e annually compared to conventional tillage practices.[21]

This is not unique to Australia. A life cycle analysis study recently published by the University of Arkansas bolsters the global literature describing the vital role of CPPs in fostering improved carbon outcomes.[22] Importantly, without pesticides, the yields of corn, cotto, and soybeans declined up to 70 percent. Cultivating corn, cotto, and soybeans without pesticides resulted in upwards of three times more land, water, energy use and greenhouse gas emissions. The targeted and judicious use of pesticides not only enhance productivity but significantly reduce pressure on water, land and energy resources per unit of production.

Enhancing yield per cultivated area through sustainable intensification has been identified as a climate change abatement tool. This is because it eliminates the need to convert more land (and the resultant emissions created by this deforestation) to meet the increasing global food and fuel demand.[23] Consequently, this approach may contribute to a global reduction in GHG emissions associated with crop production. As a nation whose sustainable agricultural practices are already world-leading, increasing production intensity also alleviates the requirement to convert natural habitats elsewhere in the world into arable land as global demand for food and feedstock increases.[24]

The toolbox must also include the latest developments in biotechnology. With recent unprecedented advances, there are numerous innovations capable of supporting decarbonisation while also providing resistance to adverse conditions. With GM technology already providing enormous opportunity for canola feedstock production, Australian farmers could soon have access to hundreds of new varieties through gene editing.

[21] Macintosh A et al, 'Improving Carbon Markets to Increase Farmer Participation' (July 2019 Agrifutures Report), 'https://agrifutures.com.au/wp-content/uploads/2019/07/19-026-Digital-1.pdf'.

[22] Thoma G et al, 'Life cycle assessment of impacts of eliminating chemical pesticides used in the production of U.S. corn, soybeans, and cotton ' (25 March 2024 CropLife America Report) 'https://static1.squarespace.com/static/5faeee45a363746603d1c6e1/t/661e95a6e057f947a1185c5e/1713280424229/CLA+LCIA+ISO+Finalized+Report.pdf'.

[23] Maartje S et al, 'Australian Grains Baseline and Mitigation Assessment' (January 2022 CSIRO Report) 'https://publications.csiro.au/publications/publication/PIcsiro:EP2022-0163'.

[24] A Read, J Rollan, C Creed and James Fell, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons', (ABARES Insights, Issue 2, July 2023), DOI: https://doi.org/10.25814/zzdq-4t23.

Gene editing technologies have already emerged as a tool for small-scale crop development. They reduce both the time and number progenitor plants needed to develop a novel crop variety. This means that despite our small and niche market size, Australian innovators can rapidly develop Australia-adapted varieties. When combined with conventional breeding and GM, we can rapidly enhance our agricultural sector. So far, innovation in this area has included:

- **Enhanced Crop Yield**s: As a major exporter of agricultural products, Australia could increase its global market share with gene-edited crops. Uncertain regulations, however, may dissuade agribusinesses from adopting these innovations.
- **Pest Resistance**: Although Australia is fortunate with respect to biosecurity, it is a constant battle. This might be best exemplified by recent emergence of fall armyworm, varroa mite and red ants as agricultural major pests. However, solutions to these problems are constantly emerging. For example, rust disease resistance in wheat[25] and Panama's disease in banana.[26]
- **Ensuring Sustainability**: With ambitious environmental targets, Australia requires significant innovation to ensure these targets are met while not adversely impacting food security. Since the emergence of gene editing techniques, there are continuously new examples of novel crop varieties with improved yields and resistance to numerous abiotic or biotic stresses.[27]
- **Investment in Bio-Fortified Crops**: With Australia's focus on premium and nutritional food exports, there's a window to lead in bio-enhanced food production. Unclear regulations could halt ventures from investing in this niche yet growing segment. One example, approved last year for use in Norwegian fish farms, is the Australian-developed Omega-3 canola.[28]

[25] Grains Research and Development Corporation, 'ACRCP Phase 5: Optimising genetic control of wheat rusts through identification of gene editing targets for broad spectrum wheat rust control', (04 April 2023 Webpage) 'https://grdc.com.au/grdc-investments/investments/investment?code=CSP2304-010RTX'

[26] Hort Innovation, 'A platform for gene editing vegetative propagated crops (AS20000)', (February 2023 Webpage) 'https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/as20000'

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- I**mproved Plant Oil Content**: In addition to bio-fortification, Australia continues to develop crops for highly efficient biofuel. This is achieved through the selection and engineering of plants for increased oil production.[29]

Attachments:

- Submission to the Ag and Land Sector Plan
- Submission to the Low Carbon Liquid Fuel consultation

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