

A Future Made in Australia: Unlocking Australia's carbon liquid fuel opportunity



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 biologically 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 only advocates for policy positions that deliver whole of industry and national benefit.

CropLife Australia is also a member of CropLife Asia and part of the CropLife International Federation of 91 national associations globally. Our focus is, however, specifically on the Australian agricultural sector and ensuring it remains internationally competitive through globally leading productivity and sustainability achieved through access to world-class technological innovations and products of the plant science sector.

The plant science industry contributes to the nation's agricultural productivity, environmental sustainability and food security through innovations in both 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 (CPPs), while the plant science industry itself directly employs thousands of people across the country.¹

CropLife welcomes the opportunity to provide a submission to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts' consultation on the role of Government in expanding the role of Low Carbon Liquid Fuels (LCLF) in decarbonising Australia's economy.

Enhancing Australia's capacity to domestically produce 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.

Critical to the development of a sustainable and viable industrial base for the Australian production of LCLF is ensuring the availability of low emissions intensity feedstock. While the consultation paper recognises the critical nature of efficient crop production to this outcome, outside of creating consistent demand for feedstock crops, insufficient attention is provided to the policy issues to ensuring this supply. Identifying these policy solutions must be cognisant of the international recognition that low carbon biofuels are facing a crisis of feedstock supply and increasing scrutiny over competition between the use of arable land for food or fuel.²

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

² International Energy Agency, '*Renewables 2022*' (2022 IEA Report) '<https://www.iea.org/reports/is-the-biofuel-industry-approaching-a-feedstock-crunch/>'

This comes at a time when almost 50 percent of Australians now feel anxious or struggles to consistently access adequate food.³ Handled well, however, the sector could provide additional opportunities to our farmers. For example, the development of a local low carbon fuel industry provides a synergistic opportunity with the goal of agricultural decarbonisation.

Existing and emerging innovations developed and/or implemented by the plant science industry means that there are technically feasible solutions to ensuring the necessary volume of feedstock is available to an emerging Australian LCLF production sector. However, current policy settings have meant that Australia is no longer a favoured jurisdiction for the commercial investment necessary for many of these newer technologies being made available to Australian farmers.

As such, settings that focus on supporting the commercialisation of agricultural innovation that enable the following outcomes should be included within any Government policy to grow the production of LCLF in Australia.

- Increased productivity and reduced emissions intensity of biofuel feedstock from agricultural crops. This will not only enable more food and more feedstock to be grown from available arable land, but also reduce the agricultural emissions that will be accounted within the scope of any LCLF produced.
- Increase adaptation of feedstock crops to more marginal land to reduce conflict with the production of food crops.
- Develop feedstock crop varieties that are more suitable for use in the production of LCLF.

³ Foodbank, '*Foodbank Hunger Report 2023*' (2023 Foodbank Report) '<https://reports.foodbank.org.au/foodbank-hunger-report-2023>'

2. ENSURING FEED STOCK SUPPLY

CropLife supports Australia’s commitment to the global climate change ambitions outlined within the Paris Agreement and our economy-wide goal to balancing greenhouse gas emissions and removals. As outlined in the Paris Agreement, it is important that this is undertaken in a manner that not only promotes resilience to the adverse effects of climate change, but also develops low greenhouse gas (GHG) emissions in a manner that does not threaten food production.⁴ As such, policy settings that will support increasing feedstock production and which will support the industrial production of LCLF need to balance potential impacts on food production.

To achieve this all sectors of the Australian economy must work together using every tool available. This includes leveraging traditional knowledge, existing proven tools and emerging innovations.

CropLife agrees with the position that Australia has significant ‘advantages in feedstock production’ asserted in the LCLF consultation document, however, this cannot be taken for granted. While Australian farmers are some of the world’s most efficient and Australian scientists and plant breeders some of the most innovative, inaction and limited policy support have placed this in great jeopardy.

The pongamia (*Pongamia pinnata*), a large tree that produces oil-rich seeds, acknowledged in the consultation paper, is proving to be an exciting feedstock capable of growing in adverse conditions. However, it is far from a panacea for decarbonisation. With the perennial trees having a long maturation time of 4-6 years which, when combined with inconsistent government policy, can create significant risks for farmers and potential delays. To ensure a viable industry and consistent feedstock supply it is critical that we also acknowledge our existing successes. For example, genetically modified (GM) canola has lowered inputs required while reducing the carbon output of our crop.⁵ This has ensured the Australian canola industry meets the strict European Union greenhouse gas emissions targets and thus providing a highly lucrative market for Australian Producers.⁶ However government must ensure that non-science based international policy positions driven by some overseas jurisdictions, such as many we see in the EU, do not warp the foundation of good policy in Australia in achieving better outcomes in decarbonising the economy.

⁴ United Nations, ‘Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104’, Article 2.

⁵ Grains Research and Development Corporation (GRDC), ‘GM Canola Impact Survey’ (2013 GRDC Report) ‘<https://grdc.com.au/resources-and-publications/all-publications/publications/2014/03/gm-canola-impact-survey>’.

⁶ Commonwealth Scientific and Industrial Research Organisation (CSIRO), ‘Greenhouse credentials of canola industry recognised by European Commission’ (September 2023 Webpage) ‘<https://www.csiro.au/en/news/all/news/2023/september/greenhouse-credentials-of-canola-industry-recognised-by-european-commission>’.

3. EXPANDING THE TOOLBOX

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.⁷ 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 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.⁸

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 outcomes⁹. Importantly, without pesticides, the yields of corn, cotton, and soybeans declined up to 70 percent. Cultivating corn, cotton, 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.¹⁰ 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.¹¹

⁷ Department of Agriculture, Fisheries and Forestry and ABARES, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons' (July 2023 Report)
'<https://www.agriculture.gov.au/abares/products/insights/environmental-sustainability-and-agri-environmental-indicators>'.

⁸ 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>'.

⁹ 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>'.

¹⁰ Maartje S et al, 'Australian Grains Baseline and Mitigation Assessment' (January 2022 CSIRO Report)
'<https://publications.csiro.au/publications/publication/Plcsirop:EP2022-0163>'.

¹¹ Department of Agriculture, Fisheries and Forestry and ABARES, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons'; Aaron T. Simmons, Annette L. Cowie, and Philippa M. Brock, 'Climate Change Mitigation for Australian Wheat Production' (10 July 2020 *Science of The Total Environment* 725:138260),
'<https://doi.org/10.1016/j.scitotenv.2020.138260>'.

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.

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 Yields:** 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 wheat¹² and Panama's disease in banana¹³.
- **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.¹⁴
- **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.¹⁵
- **Improved Plant Oil Content:** In addition to bio-fortification, Australia continues to develop crops for highly efficient biofuel.¹⁶ This is achieved through the selection and engineering of plants for increased oil production.

¹² 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>'

¹³ 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>'

¹⁴ Hamdan MF et al, 'Genome Editing for Sustainable Crop Improvement and Mitigation of Biotic and Abiotic Stresses' (2022 *Plants*, 11, 2625).

¹⁵ Aquaterra, 'Norway Approves Aquaterra Omega-3 Oil for Use in Aquafeed' (28 June 2023 Webpage) '<https://aquaterraomega3.com/norway-approves-aquaterra-omega-3-oil-for-use-in-aquafeed>'.

¹⁶ Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's next oil boom might just come from plants, (4 April 2017 Webpage) '<https://www.csiro.au/en/news/All/News/2017/April/Australias-next-oil-boom-might-just-come-from-plants>'.

4. REGULATORY CERTAINTY

Despite the potential in emerging technologies and products, delays in regulatory reform have stymied investment and worked to keep the farmer toolbox closed. It will soon be seven years since the commencement of the Third Review of the Gene Technology Scheme and six years since the recommendations were published. There is still no timeline for their implementation. Additionally, the finalisation of Food Standards Australia & New Zealand Proposal P1055 – ‘Definitions for gene technology and new breeding techniques’ – has been ongoing since 2018. The current timeline is mid-2024, but this has slipped several times previously. These two delays have created regulatory uncertainty and lack of clarity of a pathway to market. This is proving to be one of the most significant barriers for the Australian biotechnology sector and the source of sector-wide concern

With an existing substantial investment from Australia’s 15 Rural Research and Development Corporations, CSIRO, universities, NGOs, farmers and companies, Australian agriculture remains highly innovative. However, to realise the potential of this investment, a clearly defined pathway from lab to field is desperately needed.

Australia, once a world leader in the regulation of biotechnology, has fallen behind many of our largest trading partners and competitors including Argentina, Brazil, Canada, China, Japan, the United Kingdom and the United States. The greatest risk is that Australian-, developed innovations will be purchased cheaply and introduced into foreign markets, where they would compete directly with Australian farmers. Moreover, without constant innovation, it may be impossible to ensure Australian grown feedstocks, such as canola, maintain their certification as green.

To establish a local low carbon fuel sector, with the economic benefits that entails, it is important that government policy settings and associated regulatory frameworks provide the stability and support the confidence necessary to underpin commercial investment decisions by the agricultural sector. Policies need to consider the regulatory settings that impact up and downstream of fuel manufacturing, as well as the nation’s farming sector. They must also consider how incentives for feedstock may impact food security and land clearing.

5. CONCLUSION

CropLife commends the move towards low carbon fuel made in Australia. However, we remain concerned about the narrow focus of the current consultation. To simply conclude Australia has sufficient capacity for feedstocks, does an enormous disservice to our producers and over-simplifies a highly complex process. For a local low carbon fuel industry to thrive inter-sector dialogues and genuine engagement must be undertaken. This needs to include, to name just a few, the agricultural industry, food manufacturers, transport sectors and consumer groups.

It is also important and now indeed critical for government to finalise regulatory reviews, principally the Third Review of the National Gene Technology Scheme, to provide the agricultural sector with the certainty needed for investment and innovation. Without this, our nation's farmers and producers are left behind in the global race for green feedstocks. This seemingly simple undertaking will provide access to the tools our innovators need.

A low carbon liquid fuel sector will support both the diversification and decarbonisation of the Australian economy. However, climate action cannot be a Ponzi scheme. We need sustainable action created by economically viable initiatives and frameworks that will stand the test of time. This needs to be built upon policies and regulation that provides stability.