CropLife Australia

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The agriculture and land sector plan

contributing towards Australia's goal of net zero by 2025

Department of Agriculture, Fisheries and Forestry

INTRODUCTION

CropLife Australia (CropLife) is the national peak industry organisation representing the plant science (registered agricultural chemicals and plant biotechnology innovations) sector in Australia. CropLife represents the innovators, developers, manufacturers, formulators and suppliers of crop protection products (organic, synthetic and biological based pesticides) and crop biotechnology seed innovations. CropLife's membership is made up of both large and small, patent holding and generic, Australian and International companies and accordingly, CropLife only advocates for policy positions that deliver whole-of-industry and national benefit. Our focus is, however, specifically on an Australian farming sector that is internationally competitive through globally leading productivity and sustainability and enable the most effective protection of the nation's precious biodiversity and environment. 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 (CPPs), 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 opportunity to makes a submission to the Department of Agriculture, Fisheries and Forestry's consultation to support the development of a fit-for-purpose net zero plan for the agriculture and land sectors. 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.[2]

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 Paris Agreement (Dec. 13, 2015), in UNFCCC, COP Report No. 21, Addenum, at 21, U.N. Doc. FCCC/CP/2015/10/Add, 1 (Jan. 29, 2016) [hereinafter Paris Agreement], Article 2.

As Australia considers the opportunities for agriculture to contribute to Australia's Net Zero Plan, the global importance of food systems and consequential impacts associated with any changes to policy settings in Australia must be at the front of mind. This includes inadvertent impacts on the attainment of other global Sustainable Development Goals, as well as the risks of perverse outcomes in other countries that may negate or indeed outweigh any net emissions reductions achieved in Australia due to impact on global supply and demand of food commodities.

Additionally, given the acknowledged difficulties in driving emissions mitigation across Australian agriculture,[3] the role of agriculture in achieving a net zero emissions economy must identify technological pathways that will enable the decoupling of growth in food production from emissions. These pathways must consider the suite of policy, investment and market incentives that will facilitate adoption of new technologies across the many different businesses that make up our agricultural industry. Commercial investment in the development and deployment of these technologies in a way that is profit maximising for Australian farmers has been proven to support practice change.

Sustainable agriculture practices in Australia are world leading

The discussion paper highlights that Australia's agricultural sector boasts an internationally commendable track record in terms of environmental sustainability.[4] With over 70 per cent of Australian agricultural products exported, Australians can have confidence knowing that the positive impacts of their locally applied sustainable practices extend globally.[5]

Herbicide use has underpinned the widespread adoption of no-till farming in Australia, crucial for carbon sequestration in soil. Australian farmers are world leaders in the adoption of no-till practices.[6] 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 CO_2~e annually compared to conventional tillage practices.[7]

3 Dominic Davis et al., 'Final Modelling Results | Net Zero Australia', 19 April 2023, https://www.netzeroaustralia.net.au/final-modelling-results/.

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

5 Department of Agriculture, Fisheries and Forestry and ABARES, 'Snapshot of Australian Agriculture 2023', n.d., https://www.agriculture.gov.au/abares/products/insights/snapshot-of-australian-agriculture#around-72-of-agricultural-production-is-exported.

6 Department of Agriculture, Fisheries and Forestry and ABARES, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons'.

7 Macintosh Andrew, Roberts Geoff, and Buchan Sarah, 'Improving Carbon Markets to Increase Farmer Participation' (AgriFutures, July 2019), https://agrifutures.com.au/wp-content/uploads/2019/07/19-026-Digital-1.pdf.

No-till farm practices are enabled by the use of herbicide weed control over summer fallow periods. This has increased the productivity of Australian farmers in the face of climate change, improving water use efficiency and declining yield sensitivity to drought conditions.[8] 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.[9] This clear return on investment has been a major driver of farmers adopting no-till farming, creating consequential environmental benefits, including the climate change abatement created by improved soil sequestration and reduced loss of soil carbon.

Additionally, 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 demand.[10] Consequently, this approach may contribute to a global reduction in GHG emissions associated with food 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 increases.[11]

8 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.

9 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.

10 Maartje Sevenster et al., 'Australian Grains Baseline and Mitigation Assessment' (CSIRO, January 2022), https://publications.csiro.au/publications/publication/PIcsiro: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', *Science of The Total Environment* 725 (10 July 2020): 138260, https://doi.org/10.1016/j.scitotenv.2020.138260.

Reducing future climate risk though access to innovation

ABARES modelling has demonstrated that to date, the adoption of innovation has been a critical part of Australian farmers' adaptation to climate change.[12] However, as noted in the discussion paper, there is a risk that under future climate change scenarios, the negative impacts will outpace productivity growth.

As such, it is important that Australia's response to climate change focuses on providing producers and environmental land managers with access to new productivity enhancing innovations that will also improve environmental outcomes. Key to achieving this access is ensuring Australia's operating environment does not deter innovators from investing in the development and commercialisation of products that will support productive and sustainable outcomes when used on Australian farms. This includes both products that are specifically developed for the Australian market, as well as global innovations that will support Australian farming.

Agricultural input products, including modern pesticides, are crucial to maintaining and increasing agricultural output in the face of climate change challenges. Overwhelmingly, the weight of scientific evidence does not support claims that suggest a shift away from chemical inputs in agricultural systems will support a potential reduction in GHG emissions by 2050. The analysis that is used by those advocating these solutions overlook a crucial aspect and do not fully capture the complexity of the situation. Namely, these low input agricultural systems come at a cost of a 35 per cent decline in production compared to 2010 levels.[13]

Such an outcome would deteriorate global food production and food stocks. This not only risks outcomes opposite to the Paris Agreement's stipulation that the development of a low emissions environment should not threaten food production but also presents perverse global outcomes for food system emissions. For example, a study that undertook a global consequential lifecycle analysis of conventional and organic farming systems in the UK concluded the following:

> "*... widespread adoption of organic farming practices would lead to net increases in GHG emissions as a result of lower crop and livestock yields and hence the need for additional production and associated land use changes overseas. It is not obvious how additional overseas land could be found, without expanding the existing area of tilled land by ploughing up grassland.*"[14]

12 Neal Hughes and Peter Gooday, 'Climate Change Impacts and Adaptation on Australian Farms', 29 July 2021, https://doi.org/10.25814/589V-7662.

13 Xavier Poux and Pierre-Aubert Aubert, 'An Agroecological Europe in 2050: Multifunctional Agriculture for Healthy Eating', IDDRI, 1 January 2014, https://www.iddri.org/en/publications-and-events/study/agroecological-europe-2050-multifunctional-agriculture-healthy-eating.

14 Laurence G. Smith et al., 'The Greenhouse Gas Impacts of Converting Food Production in England and Wales to Organic Methods', *Nature Communications* 10, no. 1 (22 October 2019): 4641, https://doi.org/10.1038/s41467-019-12622-7.

For crop biotechnology innovations, next generation (plant) breeding techniques (NBT) alongside conventional genetic modification (GM) have already provided enormous benefit to Australian farmers' efforts as part of their sustainable agricultural practices. The opportunity for biotechnology traits will only grow more important under climate change scenarios, characterised by hotter and drier 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.[15]

Importantly, the impact of climate change on the environment will also reduce the ability for nature-based solutions to sequester carbon across the landscape.[16] Through crop biotechnology innovation, the plant science industry can develop plants that are adapted to these environmental conditions to improve the ability for vegetative and soil sequestration.

However, restrictive and outdated regulatory frameworks and systems, the absence of pathways to market and uncertainty created in the lengthy review process of the Gene Technology Scheme have inhibited the opportunity for these technologies to enhance environmental services and biodiversity protection.

Australia's small market size negatively impacts the business decision for innovating companies to undertake the investment necessary to develop new technologies here in Australia, as well as bring new technologies to Australia. This risks providing farmers with the tools to be more productive under climate change scenarios and to further contribute to emissions reductions through more input efficient farming systems and removals through sequestration. Furthermore, it also risks the investment necessary to maintain the national scientific expertise necessary to ensure that niche products can be developed for Australian conditions when required.

[15] ' 2019 Annual Report' (CommBank, 2019), https://www.commbank.com.au/about-us/investors/annual-reports/annual-report-2019.html.

[16] Sarah E. McDonald et al., 'Grazing Management for Soil Carbon in Australia: A Review', *Journal of Environmental Management* 347 (1 December 2023): 119146, https://doi.org/10.1016/j.jenvman.2023.119146.

Global and national food security

With Australian food production playing an important role in global food security,[17] it is important that policy settings for agriculture's contribution to an Australian net zero economy considers the impact of decarbonisation on global food production. As outlined above, any reductions in Australian productivity related to reducing our agriculture industry's net emissions may inadvertently result in an increase of GHG emissions related with global agriculture. This is due to the shift in agricultural production from Australia to elsewhere in the world and the GHG emissions related to the necessary conversion of land from native vegetation to land suitable for cropping or grazing.[18]

This indeed was the scenario considered by the CSIRO as part of its recent examination of the potential of the Australian grain industry's ability to mitigate its GHG emissions. This study found that under current technology scenarios, net reductions were most likely to be accompanied by reductions in production, with consequential food-based emissions exceeding the reductions in Australia resulting elsewhere. Because of the relatively low GHG emissions intensity of Australian production, these impacts are more acute due to the combination of deforestation and production emissions.[19]

To mitigate these risks, it is important for the plans developed for agriculture's contribution to Australia's Net Zero Plan include a focus on the development and adoption of technologies that decouple agricultural production from emissions. This will require the Australian Government to form strong relationships with the agriculture sector and science-based input industries, such as the plant science industry. Members of the plant science industry have a demonstrable commitment to working with Australian farmers as part of their significant investment in R&D to develop and provide science-based innovations that can be safely and profitably deployed.

With recent global events demonstrating that food security is paramount for national security and stability, the role of plant science innovations in growing food security, while reducing agricultural emissions, is important to the goals of the Paris Agreement.

17 Canberra, 'Australian Food Story: Feeding the Nation and Beyond', text (Parliament of Australia, House of Representatives), Australia, accessed 11 December 2023, https://www.aph.gov.au/Parliamentary_Business/Committees/House/Agriculture/FoodsecurityinAustrali/Report.

18 Sevenster et al., 'Australian Grains Baseline and Mitigation Assessment'.

19 Ibid.

Enabling a circular economy

CropLife and its members have a long-standing record and commitment to the stewardship of their products with a whole-of-lifecycle approach. This approach ensures human health and safety and the responsible and sustainable management of the environment and trade issues associated with agricultural chemical and crop biotechnology use in Australia. Our member companies contribute millions of dollars each year to stewardship activities that ensure the safe and effective use of their products.

CropLife ensures the responsible use of these products through its mandatory Members' Code of Conduct and a suite of comprehensive and world-leading industry stewardship initiatives and programs, StewardshipFirst. Spearheading industry stewardship, CropLife has established a benchmark for waste management and recycling programs – enabling a circular economy. Notably, ***drum****MUSTER*®, bagMUSTER® and ChemClear®, administered by CropLife's wholly-owned stewardship and safety organisation, Agsafe, exemplify this. These programs provide a pathway for removing waste off farm and responsibly disposing or recycling it, including those classified as dangerous goods, containers and agricultural plastics waste.

Protecting our biodiversity

CropLife member company products enable the sustainable intensification of agricultural production systems to deliver increased global food security and minimising the need for further deforestation of natural environments, here and internationally, to meet global nutrition requirements. Since 1940, advances in crop varieties and farming practices have improved yields of our most critical crops by over an order of magnitude. This means more can be grown in a much smaller space with a much lower environmental impact. By adopting these practices and embracing new technologies, Australian farmers have boosted agricultural productivity, successfully shifting land use from agriculture to nature conservation.[20]

With arable lands predicted to decline and weather patterns becoming more variable due to climate change, Australia requires access to crops and crop protection products capable of thriving in droughts or high salt conditions. Now more than ever, access to the innovations of the plant science industry for sustainable agricultural intensification is paramount for achieving the Paris Agreement.

[20] Department of Agriculture, Fisheries and Forestry and ABARES, 'Environmental Sustainability and Agri-Environmental Indicators – International Comparisons'.

In addition to food security, sustainable intensification of agricultural production systems also plays a prominent role in protecting Australia's rich biodiversity, both during containment and eradication of invasive species incursions, but also in managing and mitigating established invasive species. Australia now has more foreign plant species than native species.[21] This is not a new trend. In 2006, the then NSW Department of Environment and Conservation listed weeds and other pests as second only to habitat loss as a cause of biodiversity decline and cautioned that weeds presented the greatest threat to our National Parks.[22] Not only do invasive species threaten Australia's unique biodiversity, invasive plants are the costliest pests in Australia, costing $200 billion since 1960.[23] Herbicides offer the only truly effective option for removing invasive weeds from Australia's bushland reserves.[24]

[21] 'Key Findings | Australia State of the Environment 2021', accessed 30 November 2023, https://soe.dcceew.gov.au/land/key-findings.

[22] Department of Environment and Conservation (NSW), 'State of the Parks', 2004, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/state-of-the-parks-2004-050051.pdf; Aaron Coutts-Smith and Paul DOWNEY, *The Impact of Weeds on Threatened Biodiversity in New South Wales: Technical Series No. 11, CRC for Australian Weed Management*, CRC for Australian Weed Management Technical Series (CRC for Australian Weed Management, 2006).

[23] Corey J. A. Bradshaw et al., 'Detailed Assessment of the Reported Economic Costs of Invasive Species in Australia', *NeoBiota* 67 (29 July 2021): 511–50, https://doi.org/10.3897/neobiota.67.58834.

[24] Invasive Species Council, 'Glyphosate: A Chemical to Understand', November 2020, https://invasives.org.au/wp-content/uploads/2020/11/Glyphosate-A-Chemical-to-Understand.pdf.