



**Submission to the Agriculture &  
Land Sector Decarbonisation Plan**

13<sup>th</sup> December 2023

## About Nufarm

Nufarm is an agricultural innovator developing integrated solutions for our customers. Nufarm is developing plant-based solutions and crop protection products that help address our changing nutrition and energy needs. We are a proud, 100-year-old Australian company that invests in solutions tailored to the needs of local growers.

Nufarm's seed division, Nuseed, develops sustainable plant-based solutions for growers, the agriculture industry and end-use customers. Since its inception in 2006, Nuseed has been at the forefront of oilseed innovation that supports sustainable food and biofuel production in Australia and beyond.

## Executive Summary

### The need for higher ambition

- Each year, the world reaches new milestones that reinforce how critical plant science and innovation are to human and environmental health.
- Climate change is accelerating, leading to more frequent and intense extreme events. The decarbonisation of our economies is disrupting all industries including agriculture, presenting both challenges and opportunities.
- Against this backdrop, incremental change is clearly insufficient, and bold, step-change solutions are required.

### Decarbonising agriculture through renewable feedstocks and fuels

- There are established and emerging solutions that will help Australian farmers lower their carbon emissions through the sustainable production of crop-based feedstocks for renewable fuels.
- Greater utilisation of local crop-based feedstocks for renewable fuel production can support agricultural decarbonisation through the increased removal and storage of carbon, and production of biodiesel for use in farm machinery.
- The development of a local renewable fuels industry will facilitate the scaling of feedstock production that will support farmers' sustainability, productivity, profitability and resilience.

### The role of crop protection products in helping farmers mitigate and adapt to climate change

- Crop protection products are critical tools that help farmers maximise production from their land and adopt conservation practices such as no-till farming.
- These tools will also help farmers adapt to the shifting patterns of pest, weed and disease pressures brought about by climate change.
- Recognition of and support for the role of crop protection products in climate change mitigation and adaptation will encourage further innovation and greater community understanding of their role in supporting sustainable agriculture.

### Developing emissions pathways and enabling change

- Australian farmers can both drive and benefit from the energy transition through the sustainable production of biogenic feedstocks that supports the decarbonisation of other hard to abate sectors such as transport and aviation.
- Well-designed policy can generate robust demand for lower carbon liquid fuels such as biodiesel and SAF, driving the development of a local renewable fuels market into which Australian farmers can deliver locally grown feedstocks.

## 1. The need for higher ambition

Each year, the world reaches new milestones that only reinforce how critical plant science and innovation are to human and environmental health. The global population continues to rise, with India overtaking China to become the world's most populated country, now home to more than 1.4 billion. Climate change is accelerating, leading to more frequent and intense extreme events. The decarbonisation of our economies is disrupting all industries including agriculture, presenting both challenges and opportunities. Nufarm's innovation and solutions lie at the intersection of these megatrends.

We are driven by a belief that a blend of scientific breakthroughs, product innovation, novel business models and value chain collaborations can deliver new solutions and markets to help solve the world's sustainability challenges.

Since 1960, food production has quadrupled with negligible increase in agricultural land use. Without the innovations of the plant science industry, more land would be required to produce the same amount of food. Plant science technologies have helped increase agricultural productivity while reducing land use. These productivity enhancements will continue as we harness new technologies and partnerships.

We welcome the opportunity to contribute to the Agriculture and Land Sectoral Plan and share our perspective on how Australian farmers can play an even bigger role in lowering emissions and supporting the country's sustainable growth.

## 2. Decarbonising agriculture through renewable feedstocks and fuels

This section identifies solutions and practices that address the following discussion paper categories:  
Cropping & Horticulture | Fuel & Energy | Carbon storage in the land

### 2.1 Section key points

- There are established and emerging solutions that will help Australian farmers lower their carbon emissions through the sustainable production of crop-based feedstocks for renewable fuels.
- Greater utilisation of local crop-based feedstocks for renewable fuel production can support agricultural decarbonisation through the increased removal and storage of carbon, and production of biodiesel for use in farm machinery.
- The development of a local renewable fuels industry will facilitate the scaling of feedstock production that will strengthen farmers' sustainability, productivity, profitability and resilience.

### 2.2 Pathways to decarbonise farming through renewable feedstocks and fuels

[Bioenergy Australia](#) estimates that 45% of Australia's total energy use comes from liquid fuels. Hard-to-abate sectors such as agriculture and transport will continue to rely on liquid fuels in the medium to long term. Locally produced renewable feedstocks and fuels can help decarbonise these hard-to-abate sectors while strengthening Australia's fuel security and supporting the country's net-zero transition.

Sustainably produced oilseeds are critical feedstocks for renewable fuel production and can help farmers lower their carbon emissions through:

1. **Renewable feedstock production:** Growing oilseed crops for feedstocks that remove and restore carbon to their soils as part of a suite of sustainable crop management practices.
2. **Renewable fuel utilisation:** Utilising the renewable diesel produced in greater quantity through increased domestic feedstock production.

Decarbonising the liquid fuels we will rely on for decades to come is not a niche solution - it is a scalable, cost-effective way to reduce greenhouse gas emissions from hard-to-abate sectors. Renewable fuels will

enable transport sectors to decrease emissions without retrofitting existing fleets. These fuels can also benefit the agriculture sector by decarbonising farm vehicles and machinery which typically have longer lifespans.

The Centre for Entrepreneurial Agri-Technology, a joint venture between Australian National University and CSIRO, highlighted the importance of strengthening sovereign capabilities in key farm inputs such as fuel in its submission to the parliamentary food security inquiry. The Centre highlighted the need for local fuel supply and stocks, including increased renewable fuels such as biodiesel for agriculture.<sup>1</sup>

Australia has the natural resources and an agricultural sector with the capabilities and [sustainability credentials](#) to meet the growing demand for renewable feedstocks while minimising or avoiding land use change such as deforestation. As we outline below, advances in plant science, crop management and rotation changes, along with clearly defined sustainability standards and certification systems will enable increased crop-based feedstock production that supports decarbonisation and ensures a reliable supply of food and fuel.

### 2.3 Established and emerging solutions

As the government's *Agriculture, land and emissions* discussion paper recognises, Australia's export-oriented agriculture sector can play an important role as a supplier of lower-emissions food and fibre. However, it is important to acknowledge that Australia is already an established exporter of low emissions crop-based feedstocks for use in renewable fuels in Europe. Approximately 60% of the canola exported from Western Australia to Europe is converted into renewable fuel due to policy requirements for bioenergy production and use in the EU.

In September 2023, the [European Commission reapproved](#) the use of Australian canola in European renewable fuels following the findings of a CSIRO report commissioned by the Australian Department of Agriculture, Fisheries and Forestry that demonstrated the local canola industry's 'low emissions credentials' as an established decarbonisation solution. This highlights three critical points:

1. Australian grain growers are already recognised for their 'low emissions credentials' allowing them to maintain access to international market and supply chains.
2. Growth in Australian canola production, including for use in renewable fuels in Europe, has not come at the expense of key food crops such as wheat which has also increased in production since 2017/18.<sup>2</sup>
3. Without a viable domestic renewable fuels industry and market, Australian farmers will continue to sell their feedstocks to more lucrative international markets limiting the potential for additional local decarbonisation.

The recently published [CSIRO/Boeing SAF Roadmap](#) highlights the potential for non-edible oilseeds such as Carinata to meet bioenergy feedstock demand: "Non-edible oilseeds offer the opportunity of cultivating and utilising crops that do not have to compete with food markets and can use marginal or degraded land."

Nuseed Carinata (a brassica similar to canola) can help Australian farmers to meet the rapidly rising demand for renewable feedstocks while reducing their emissions and improving their productivity and sustainability.

[Nuseed Carinata](#) is a non-food oilseed cover-crop, contract grown between main crop rotations, harvested then crushed into an independently certified sustainable lower carbon oil feedstock. It

#### Value Chain Innovation

Our [global partnership](#) with bp will support the scaling up feedstock production and processing into renewable fuels for end users.

<sup>1</sup> [Australian Food Story: Feeding the Nation and Beyond \(aph.gov.au\)](#), p. 69.

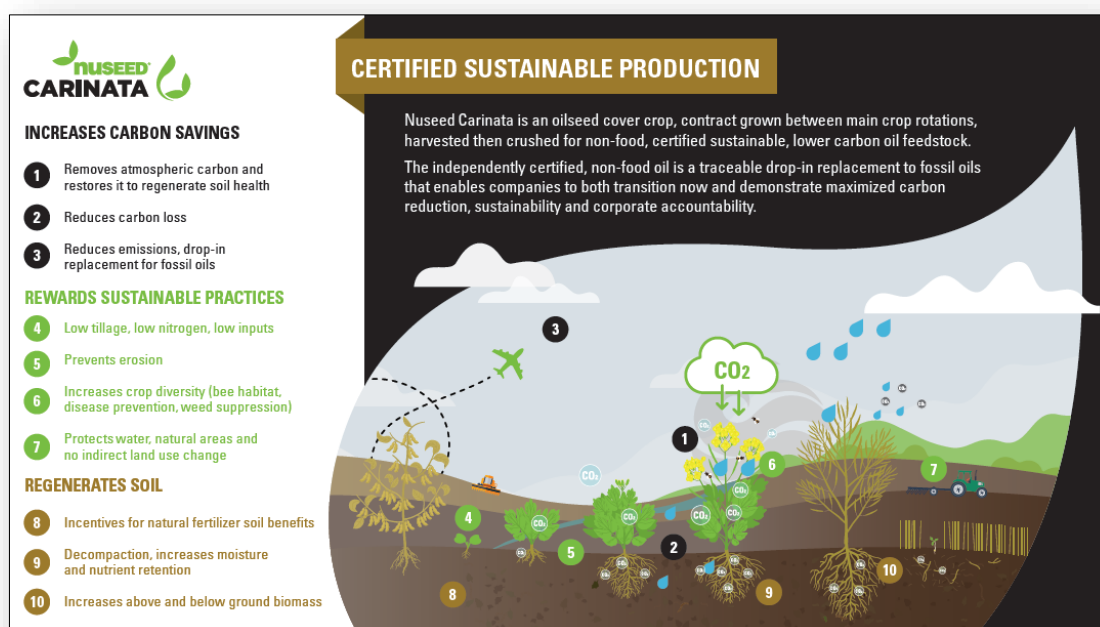
<sup>2</sup> ABARES 2023 data

does not compete with food or contribute to land-use change as it is grown under contract as a cover or secondary crop and can grow on degraded land.

Nuseed Carinata removes atmospheric carbon and restores soil carbon as it grows. It also protects soil from erosion and nutrient loss, increases below and above ground biomass to regenerate soil, and supports biodiversity through increasing pollinator habitat and crop diversity. A co-product from the Carinata oilseed crush is a high protein meal which can supply the growing market for high quality animal feeds, supporting our food security.

Nuseed Carinata Oil is a scalable, lower carbon drop-in replacement for fossil oils that supports decreased carbon emissions without retrofitting existing fleets, including farm vehicles and machinery. The International Civil Aviation Organization (ICAO) includes Carinata as a low-carbon fuel feedstock with similar greenhouse gas (GHG) footprint as waste and residuals, like used cooking oil.

The development of the Nuseed Carinata program in Australia is underway and we are determining the fit for the crop in the local agriculture system. Hybrid trials continue and we are planning to undertake commercial trials in 2024.



## 2.4 Recommendations to achieve higher decarbonisation ambitions

Without a viable domestic renewable fuels industry and market, Australian farmers will continue to sell their feedstocks to more lucrative international markets. The lack of clear policy settings may also impact the local production of feedstocks. These policy recommendations will drive the rapid development of a responsible, globally competitive renewable fuels industry in Australia that directly supports the decarbonisation of the agriculture sector and beyond:

### 1. Establish globally aligned standards and certification schemes

- a) Ensure Australia implements globally aligned standards and certification schemes to support our international competitiveness. This will allow local feedstocks to compete on a level playing field with other markets. This requires the identification of the renewable fuels and sustainability criteria to be accepted for use in Australia.
- b) Leverage Australia's existing high standards in supply chain integrity and traceability to ensure a domestic certification system is consistent with the standards of established global systems.

## 2. Build domestic demand for renewable fuel to encourage local feedstock production

- a) Adopt similar policy incentives that are driving demand for biofuels in other markets. For example, Australia should implement a low carbon fuel standard (LCFS) as a broad-based market approach to incentivise the development and demand for technologies to decrease the carbon intensity of fuels. Increased domestic demand will encourage investment to quickly scale local feedstock production and spur innovation across the transportation and fuels supply chain.
- b) Maximize incentives for renewable fuels under existing policies such as the Safeguard Mechanism. To achieve this, adopting a market-based accounting approach under the National Greenhouse Energy Reporting Scheme will allow safeguard entities to claim the full emissions reductions for biofuels delivered using shared pipework or tanks. Establish a life-cycle based emissions reporting system to underpin additional policy such as an LCFS.
- c) Commit the Australian Government to procurement targets for Defence and other departments to purchase biofuels to send a clear signal to the market and lock in a baseline of demand.

## 3. Strengthen agriculture's role in sustainable feedstock production

- a) Allocate government funding to research and development, capital grants and concessional loans to support sustainable biogenic feedstock innovation, aggregation and productivity.
- b) Encourage proactive government advocacy to farmers highlighting their crucial role in sustainably producing feedstocks for biofuel production. Policy should also reward the adoption of sustainable farming practices to regenerate soil, improve biodiversity and increase GHG savings.
- c) Collaborate with agricultural industry bodies and diverse thought leaders to communicate to the community the environmental, economic and sovereign capability value of utilising locally grown feedstocks. Reinforce the capability of Australian agriculture to sustainably produce food and fuel.

## 3. The role of crop protection products in helping farmers mitigate and adapt to climate change

This section identifies solutions and practices that address the following discussion paper categories:  
Cropping & Horticulture | Carbon storage in the land

### 3.1 Section key points

- Crop protection products are critical tools that help farmers maximise production from their land and adopt conservation practices such as no-till farming.
- These tools will also help farmers adapt to the shifting patterns of pest, weed and disease pressures brought about by climate change.
- Recognition of and support for the role of crop protection products in climate change mitigation and adaptation will encourage further innovation and greater community understanding of their role in supporting sustainable agriculture.

### 3.2 Sustainably protecting Australia's food security

Crop protection products protect crops from the moment they are sown until they are harvested. These proven tools help farmers protect their crop yields from more than 40,000 species of weed and plant-eating insects. Protecting crops from these threats is important to the future of agricultural sustainability and preventing unnecessary food loss.



A recently published [Deloitte Access Economics report](#) commissioned by plant science industry body CropLife Australia revealed that crop protection products directly enables \$31.6 billion of Australia's agricultural output annually. CropLife Australia CEO Matthew Cossey said: "The report shows that 73 per cent of the \$43.2 billion of total crop production is attributable to farmers access to and use of crop protection products.

"These innovations of the plant science industry are a crucial component driving growth in the farming sector as well as improving farming sustainability. It highlights how increasingly crucial modern agricultural chemistry is to support the agriculture sector's ambition to be a \$100 billion industry by 2030 and safeguarding food security for all Australians."



Source: Deloitte Access Economics: "Economic Contribution of Crop Protection Product in Australia"

### 3.3 Crop protection products support climate mitigation and adaption

Protecting crops will become more challenging for farmers as climate change intensifies. Farmers will have to increasingly navigate natural disasters, reductions in arable land and changing patterns of invasive weeds, insects and plant disease. Farmers will need every tool they can access to withstand the pressures of a changing climate.

Sustainably meeting the rising international demand for food, fibre and fuel will require crop protection products that can help farmers in four main ways: 1) combating the shifting patterns of biosecurity threats as they evolve with the warming climate; 2) protecting future crop varieties developed for resilience to more extreme conditions; 3) safeguarding yields against a reduction in arable land; 4) reducing the need for intensive weeding methods that cause erosion and release carbon into the atmosphere.

A [United Nations report](#) published this year revealed climate change will further drive the expansion of invasive species, which have played a key role in 60 per cent of recorded plant and animal extinctions costing an estimated US\$423 billion every year. As these invasive species grow, the need for crop protection and seed innovation becomes even more critical to protect crops and reduce crop and food loss.

Crop protection products such as glyphosate also contribute to reducing carbon emissions through low and no-tillage farming. Long-term tillage contributes to erosion and land degradation, and degraded land has limited agricultural and ecological benefit. CropLife Australia estimates that crop protection products have prevented “...soil erosion by 90 per cent by reducing tillage, but it is also reducing greenhouse gas emissions and increasing soil organic matter over time.”<sup>3</sup>

### 3.4 Recommendations to achieve higher ambitions

Crop protection products help Australian farmers protect their crops from the impact of a changing climate and reduce their carbon emissions through no-till farming. These tools reinforce our food security and capacity to sustainably meet the rising demand for food, fibre and fuel. Securing the supply of Australian-made crop protection products tailored to local conditions is also essential to local agriculture. The following high-level recommendations will help to achieve these outcomes:

- a) We encourage the government’s agriculture and land sectoral decarbonisation plan to recognise and support the critical role that crop protection products play in helping farmers maximise production from their land as well as mitigating and adapting to climate change.
- b) A policy environment that supports local innovation and sovereign crop protection manufacturing capabilities will ensure Australian farmers have reliable access to tools that strengthen local food security and sustainability. To this end, we are pleased to note a recommendation made by the [House Standing Committee on Agriculture](#) into the country’s food security recommendation that “...the Australian government support the development and expansion of the domestic production and manufacturing of essential inputs, such as fertiliser and agricultural chemicals.”

## 4. Developing emissions pathways and enabling change

Australian farmers can both drive and benefit from the energy transition through the sustainable production of biogenic feedstocks that supports the decarbonisation of the Australian economy. Locally grown feedstocks can support the production of greener alternatives that can replace the liquid fossil fuels we will rely on to meet our ongoing transport needs and will be an important part of the solution to reduce our carbon emissions from air, land and sea transport. Importantly, this can be achieved in a way that improves agricultural productivity, soil health, biodiversity and provide new income sources for farmers.

The Minister for Climate Change and Energy, Chris Bowen, highlighted the potential for renewable fuels in his [2023 Annual Climate Change Statement](#) saying “...the Government is continuing to evaluate other opportunities – such as other clean energy technology manufacturing and low carbon liquid fuels – which could provide strategic benefits to Australia by diversifying supply chains and bolstering energy security, as well as creating good jobs.”

Acting with urgency will ensure Australia realises these “strategic benefits”. This was reinforced by the CSIRO/Boeing [Sustainable Aviation Fuel Roadmap](#) which concluded: “Producing liquid fuels from local feedstocks can reduce the reliance on imports, where 90% of liquid fuels are presently sourced for Australia.” The roadmap projects that by 2025, Australia will have enough feedstocks to produce 60% of local jet fuel using biogenic feedstocks and is estimated to rise to 90% by 2050.

Well-designed policy can generate robust demand for lower carbon liquid fuels such as biodiesel and SAF, driving the development of a local renewable fuels market into which Australian farmers can deliver locally grown feedstocks. The following policy principles and the recommendations outlined above will help the

<sup>3</sup> CropLife, December 2022 <https://www.croplife.org.au/media/media-releases/celebrating-our-soils-where-food-begins/#:~:text=%E2%80%9CThe%20use%20of%20crop%20protection,soil%20organic%20matter%20over%20time>.



Australian Government better support the agriculture sector to drive innovation, build capacity and ensure the system enables emissions reductions. Well-designed bioenergy policy will:

- a) Ensure Australia is competitive with other markets with advanced bioenergy industries and provide a level playing field for all industries and technologies.
- b) Foster a market-based and technology-neutral environment to ensure Australia can attract investment to quickly scale sustainable renewable feedstock production and processing.
- c) Encourage innovation to accelerate the transition from first generation biofuels and feedstocks to more advanced lower carbon feedstocks and fuels that demonstrate sustainable carbon mitigation throughout production and over time.
- d) Address energy transition challenges without compromising Australia's food security or environment.