CONNECT

Conversation, collaboration and connection

Inside the South-West WA Drought Hub's Innovation Program

GROWER GROUP ALLIANCE
Together we grow

South-West WA
Drought Resilience Adoption and Innovation Hub

"Australia's agriculture industry, a cornerstone of economic prosperity, plays a crucial role in global food production and shapes economic growth beyond national borders."

Message from GGA's Innovation Manager

Australian farmers have developed unique and efficient farming techniques to overcome challenges posed by variable climates, and vast and ancient landscapes. The sector's heightened productivity is credited to innovations stemming from industry and public sector agricultural research investments.

However, today's agricultural sector confronts unprecedented change. Factors such as changing global markets, increasing weather variability, rising costs, labour shortages, and supply chain disturbances are posing new challenges. Particularly, extreme weather conditions, including prolonged hot and dry periods and unseasonal heavy rains, exert pressure on Australian farmers, prompting the need for adaptive strategies in the face of economic uncertainty.

With limited land available for cultivation, there is an urgent need to find innovative ways to increase productivity without expanding agriculture's footprint. This requires a shift towards sustainable, resilient, and adaptive agricultural practices, achievable only through innovation. Collaborative strategies will facilitate these innovative solutions and are essential to navigating these challenges and securing the future of Australian agriculture.

Australia is recognised for excellent agricultural research outcomes supported by multiple streams of industry and government-backed investments. However, the current mode of innovation in the agricultural sector is challenged by a siloed approach, hindering cross-industry and cross-sectoral collaboration, and limiting the flow of knowledge and innovation. This fragmented approach necessitates a more cohesive and integrated strategy for agricultural innovation.

The Grower Group Alliance (GGA) brings together diverse stakeholders across the agricultural industry and other sectors, fostering collaboration and integration. By breaking down these silos, we are ensuring a seamless flow of knowledge and innovation. We address grower-led challenges by bringing grower groups, farmers, researchers, policy makers and industry experts together to co-design solutions that transcend traditional boundaries.

The GGA's innovation mindset centres around aligning research, development, extension and adoption with the practical needs of the agricultural sector. This strategic alignment ensures that innovation is not confined to laboratories but translates seamlessly into on-the-ground practices. By promoting sustainable, resilient, and adaptive agricultural practices, we continue to support the pursuit of a more robust and future-ready state.

Jo Wisdom

Contents

The projects featured in this book were funded by the Australian Government's Agricultural Innovation Hubs Program and were initiated through the South-West WA Drought Resilience Adoption and Innovation Hub.

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gga.org.au

The Grower Group Alliance acknowledges the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders both past and present.

Cover photo by Angie Roe

Grower Group Alliance CEO, Rikki Foss, with Hub Director, Mark Holland.

The Grower Group Alliance

The Grower Group Alliance (GGA) is a thriving statewide network of over 60 farmer-led local grower groups with a collective producer membership base exceeding 4,000 farm enterprises.

GGA is engaged with the state government via the Department of Primary Industries and Regional Development (DPIRD) in a six-year, $7.3m collaboration, which aims to increase research and innovation that is demand-driven and farmer-led through WA grower groups.

GGA is currently collaborating with dozens of partners across 29 research, development, extension and adoption projects valued in excess of $63 million (cash and in-kind) aimed at innovation and practice breakthroughs for agriculture in Western Australia.

GGA Innovation Program

Producers possess a deep understanding of the challenges and risks they encounter, however, finding effective solutions can be difficult. From paddock to plate, our industry grapples with a range of complex problems. The ever-evolving nature of these challenges necessitates constant innovation.

"Through its Innovation Program, GGA facilitates collaborations between grower groups, farmers, researchers, and technology providers, to jointly develop and share knowledge to address industry challenges," Grower Group Alliance CEO Rikki Foss said.

GGA recently supported a suite of projects led by external stakeholders and enabled through grant funding from one of GGA's most significant projects, the South-West WA Drought Resilience Adoption and Innovation Hub.

Photo: Nik Callow

> "Innovation and collaboration are critical to unlocking step-changes in productivity and profitability for farmers and their communities, and these initiatives will help the Hub to deliver on this key aim."

Grower Group Alliance Study Tour, 2022. McAlpine Farms, Buntine WA.

South-West WA Drought Resilience Adoption and Innovation Hub

The South-West WA Drought Resilience Adoption and Innovation Hub (SW WA Hub) is harnessing collaboration to enhance drought resilience practices and accelerate innovation and adoption.

Funded by the Australian Government's Future Drought Fund, the SW WA Hub has been led by the Grower Group Alliance since 2021.

The SW WA Hub is playing a unique role in the agricultural ecosystem by bringing together public and private enterprise, academia, grower groups and investors.

It utilises and leverages the power of the GGA grower group network 'hub and spoke' model to facilitate greater innovation from the ground up – with the aim of helping farmers increase their resilience to the changing climate in South-West WA.

Grower groups are among the Hub's more than 50 Consortium Partners, which represent all sectors of the WA agricultural supply chain and provide cash and in-kind co-contributions.

Industry-focused Innovation Projects

In 2022, the Australian Government provided the SW WA Hub with $2.5 million to enable it to expand its remit beyond drought under the Agricultural Innovation Hubs Program.

A total of 10 exciting and diverse projects were rolled out, with focus areas ranging from paddock-level carbon benchmarking, through to drone-mounted grazing monitoring for the southern rangelands and improved vineyard floor management.

"These projects are great news for agriculture in the South-West WA agricultural region and align with National Agricultural Innovation priorities targeting exports, climate resilience, biosecurity and digital agriculture." SW WA Hub Director Mark Holland said.

This magazine showcases the results and impacts of these industry-focused innovation projects.

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Future Drought Fund
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The South-West WA Drought Resilience Adoption and Innovation Hub receives funding from the Australian Government's Future Drought Fund.

Value Added Lupin Exports

Project Lead: Department of Primary Industries and Regional Development (DPIRD)

The Australian Lupin Bean has the highest combined protein and dietary fibre content of any currently grown grain. Photo: DPIRD

Two WA based companies, The Lupin Co. and Coastal Crunch, have launched new food products on the local and export markets during the life of the project. Photo: Dorien Rodenberg.

Project overview

Australian Lupin Bean – the new name coined for the seed of the Australian Sweet Lupin (*Lupinus angustifolius*) – has the highest combined protein and dietary fibre content of any currently grown grain. However, the global food industry and consumers are generally unaware of the nutritional role lupins could play in an everyday diet.

The DPIRD Lupin exports project aimed to boost the profile of Australian Lupin Beans as a sustainable and healthy food source, as well as advance the production and export of lupin food ingredients, finished food products and concentrated livestock feeds.

The project enabled the establishment of the Sweet Lupin Western Australia Inc. (SLWA) which has brought together WA-based lupin processing and food businesses, along with technical experts.

Impacts and Results

The SLWA has now launched the Aussie Lupins website (aussielupins.org.au), an information portal that aims to provide consumers, food companies, health professionals and nutritionists with accurate up-to-date knowledge about the attributes of the Australian Lupin Bean. The site houses nutritional information, recipes, and professional resources.

The project has set the scene for business development in lupin processing in Western Australia by supporting market expansion. Two WA based companies, The Lupin Co and Coastal Crunch, have launched new food products on the local and export markets within the past 12 months.

SLWA members have acknowledged that the website and increased interest in lupin food as a result of the project has increased confidence in pursuing growth of their respective businesses.

The project has set the scene for business development in lupin processing in Western Australia by supporting market expansion.

For more information about this project, scan the QR code.

The Australian lupin is a low input, rain fed crop that builds organic nitrogen levels in the soil and contributes to ecologically sustainable farming practices. Photo: DPIRD

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Department of Primary Industries and Regional Development
Government of Western Australia

Sweet Lupin Western Australia (Inc)

For more information about this project, scan the QR code.

Four grape growers provided access to their vineyards for this project. The wineries included Roscic Estates and Sunny Valley Vineyards, representing table grapes in the Swan Valley, as well as Cape Mentelle and Plantagenet, representing wineries in the Margaret River and Great Southern regions. L-R: Caitlin Moore (UWA), David Moulton (Cape Mentelle), Joanne Wisdom (GGA). Photo: Caitlin Moore, UWA

Implementing improved vineyard floor management for premium grape production in a warm and dry Mediterranean climate

Project Lead: The University of Western Australia (UWA)

Project overview

The table and wine grape industries contribute $800 million to Western Australia's economy, but rising temperatures are challenging vineyards, compromising fruit quality, and reducing high fruit premiums for growers.

Vineyard irrigation requirements rise under drought conditions. However, growers struggle to meet the extra water demand by the vines due to reductions in their groundwater irrigation licenses during temperature extremes or lack of available surface and dam water.

Many Australian vineyards have bare interrow soils due to an industry perception that cover crops compete for essential grapevine water resources. However, the lack of ground cover can increase evaporation of soil moisture, heat reflectance into grapevines, temperature fluctuations, erosion, nutrient leaching, and weed proliferation.

This project aimed to demonstrate how winter cover crops may be dried into 'green mulch' in summer to alleviate these problems by covering bare soils without requiring further water resources.

This innovative approach offers a solution to improve vineyard climate resilience, challenging industry perceptions, and contributing to sustainable water management in Western Australia.

Impacts and Results

The project demonstrated that the cover crop did not compete with the vines for water resources during the summer fruit production months when growers rely on irrigation to keep their vines watered. This result was achieved by turning the cover crop into green mulch, which eliminated the cover crop water needs and formed a protective layer over the soil surface.

Scarlotta + Irwin Hunter interrow mix at Nuich Farm. Photo: Caitlin Moore, UWA

These findings will assist regional strategic development and water management plans in key grape growing regions of WA, and inform other grape growing regions that exist in warm and dry Mediterranean climate zones.

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THE UNIVERSITY OF WESTERN AUSTRALIA

Department of Primary Industries and Regional Development

CAPE MENTELLE MARGARET RIVER

PLANTAGENET

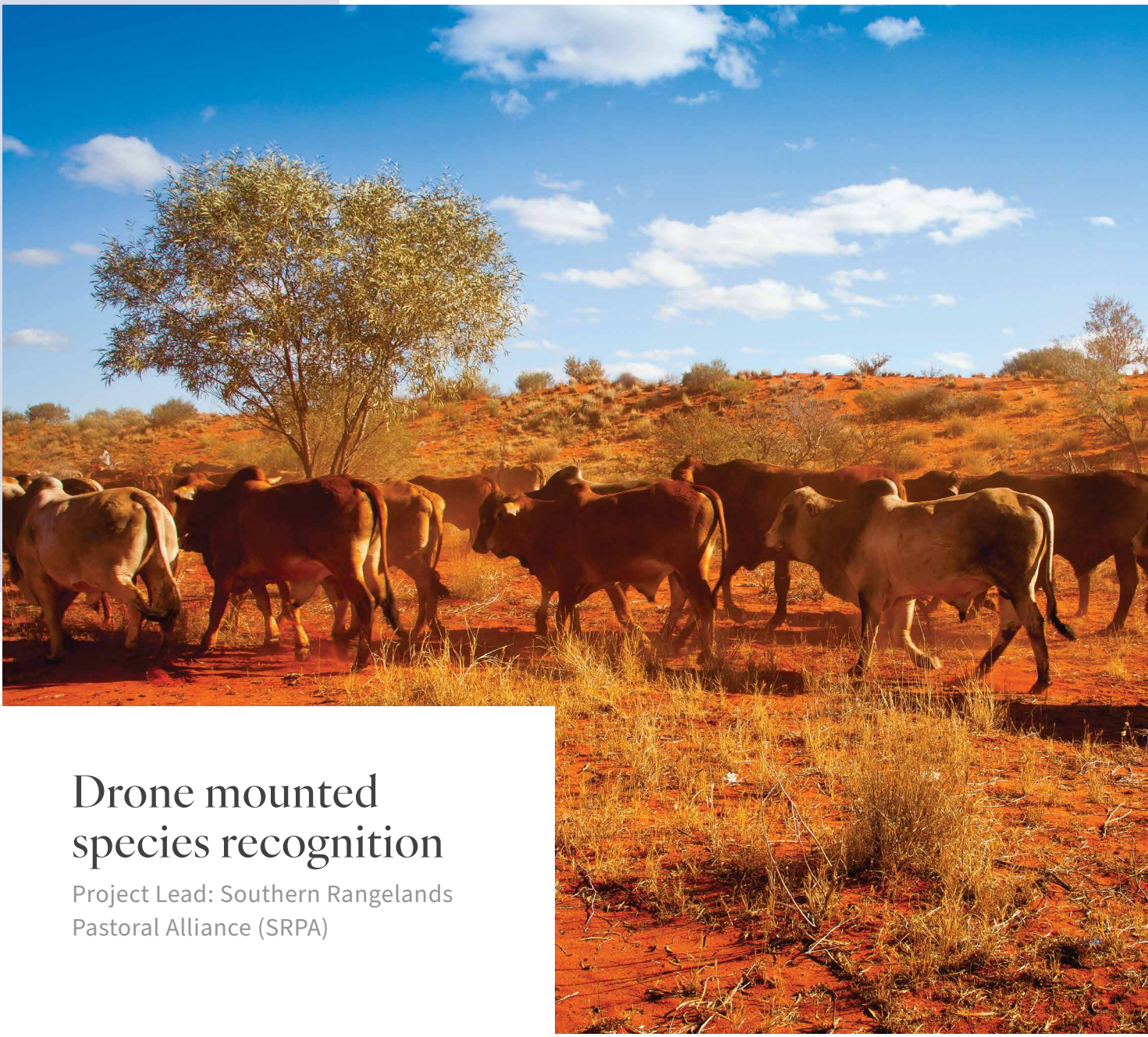
Sunny Valley Vineyard

Graeme-Roscic Estates

WINES OF WESTERN AUSTRALIA

apc AGRICULTURAL PRODUCE COMMISSION

APC Table Grape Producers' Committee



Drone mounted species recognition

Project Lead: Southern Rangelands Pastoral Alliance (SRPA)

Project overview

This project aimed to demonstrate that a drone mounted species recognition system could be used to locate and visually record feral animal species that contribute negatively to total grazing pressure.

Total grazing pressure is the ratio of the demand for pasture to the supply of pasture available. Demand can come from livestock and native or feral animals and is the leading cause of environmental degradation in the Southern Rangelands.

GPS positioning of feral animals will allow economic removal in the short term by pastoralists or biosecurity groups and long-term monitoring will provide a data base of feral animal movements and their interactions with other livestock and their environment.

This technology will be particularly important in times of low feed availability, such as low rainfall years or drought, since it will greatly assist the management of non-domestic grazers and enable better rangeland management.

Impacts and Results

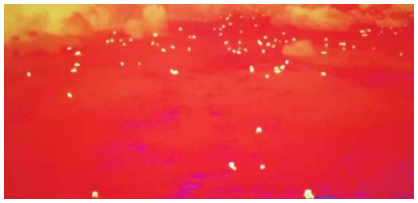
This project demonstrated that a drone can be used successfully to identify various animal species. Due to seasonal conditions the research team were unable to locate some of the larger pests such as feral dogs and camels. Instead they switched to detecting and identifying smaller species (birds, rabbits), which are more challenging and further proved the capability of the technology.

This technology may lead to economic benefits by reducing costs associated with feral animal monitoring and targeted management. The impact is likely to focus on improved livestock body condition from more feed, reduced infrastructure damage, targeted control, and industry revitalisation. Environmentally, such information could help to decrease total grazing pressure, mitigate land degradation, and enhance animal welfare.

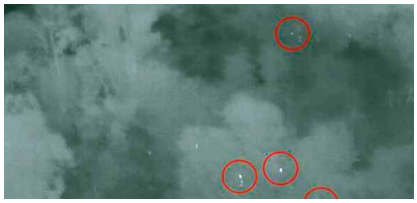
Biosecurity benefits include fewer feral animals and diseases, ensuring food chain integrity.

L-R: Daniel Kidd (GGA), Mayne Jenour (station owner), Nigel Brown (Autonomous Technology), Jo Wisdom (GGA).

Testing of the drone technology occurred on three properties in the Murchison region. Photo: Autonomous Technology



The drone can detect feral herbivores, such as camels, donkeys and kangaroos (pictured). Ambient heat can be seen on the ground area where kangaroos have been lying down (or even standing) for long periods of time. Photo: Autonomous Technology



Although the research team was not able to detect feral predators (wild dogs, feral cats) despite many hours of flying, they were able to profile smaller animals that are more difficult for the system to identify, such as birds (pictured) and rabbits. Photo: Autonomous Technology

For more information about this project, scan the QR code.

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Southern Rangelands PASTORAL ALLIANCE

AUTONOMOUS TECHNOLOGY

RPAWA

Developing automated technology to assess natural capital on pastoral leases

Project Lead: Southern Rangelands Pastoral Alliance (SRPA)

Project overview

This project aimed to automate natural capital assessment in the Southern Rangelands by developing integrated digital technologies to objectively measure biodiversity, weather, and soil attributes, reducing the reliance on human observation.

It involved digitising historical records, utilising public data repositories and deploying readily available devices for on-ground measurements at four pilot sites.

These sites hosted weather stations, soil probes, and monitoring cameras, which enabled the testing of machine learning tools for object identification.

This project supports the emerging Natural Capital market in the region, where remote and challenging landscapes necessitate urgent monitoring and management.

This project lays the foundation for ongoing data collection, allowing for benchmarking, monitoring improvements, and contributing valuable insights for natural capital accounting in the Southern Rangelands. It also serves as a pilot, offering lessons for other pastoralists in remote Western Australia seeking to implement similar monitoring programs.

Impacts and Results

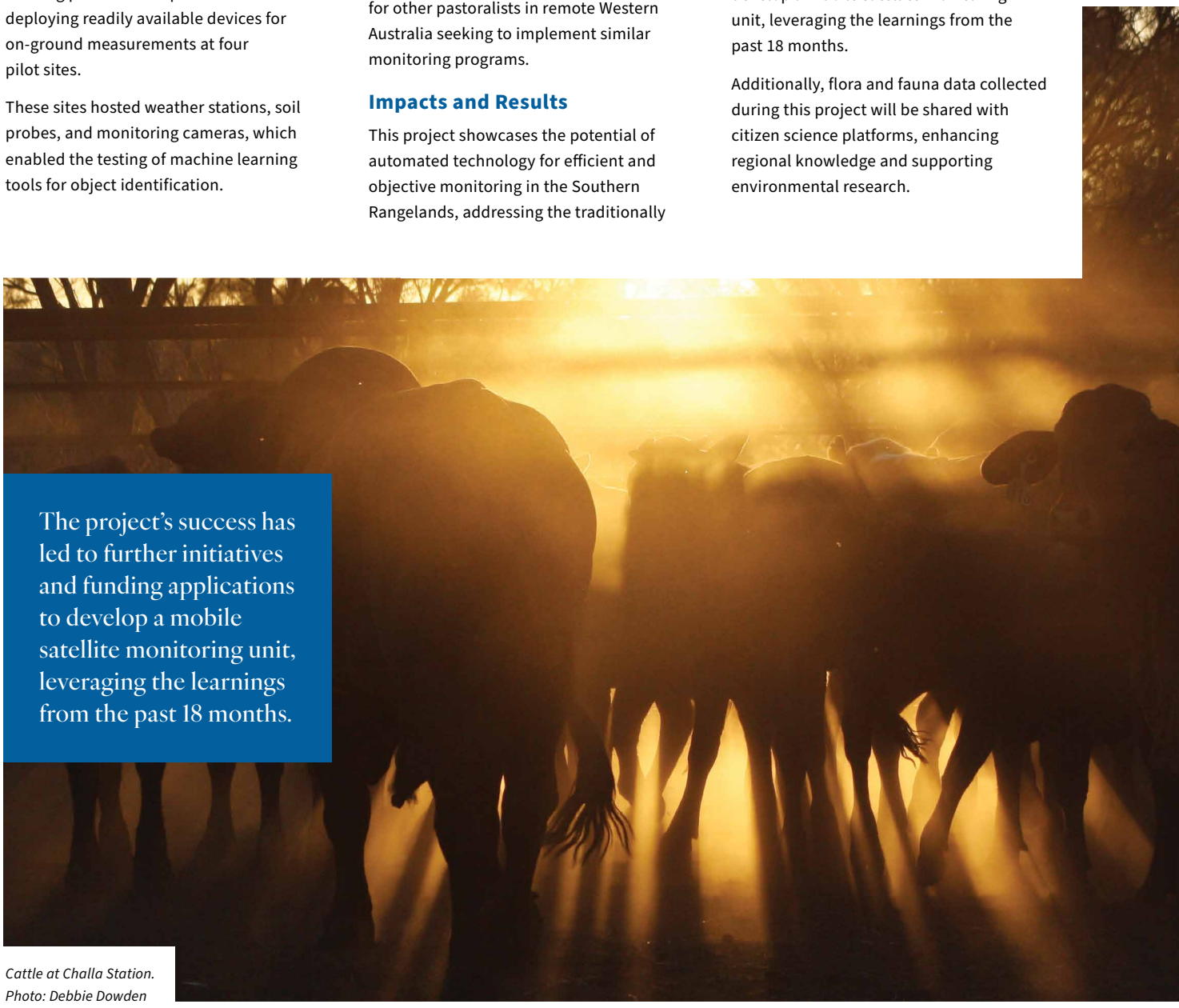
This project showcases the potential of automated technology for efficient and objective monitoring in the Southern Rangelands, addressing the traditionally time-consuming and subjective nature of the task.

It also highlighted current technology limitations based on connectivity requirements, which are expected to improve with ongoing connectivity advancements in remote areas.

The project's success has led to further initiatives and funding applications to develop a mobile satellite monitoring unit, leveraging the learnings from the past 18 months.

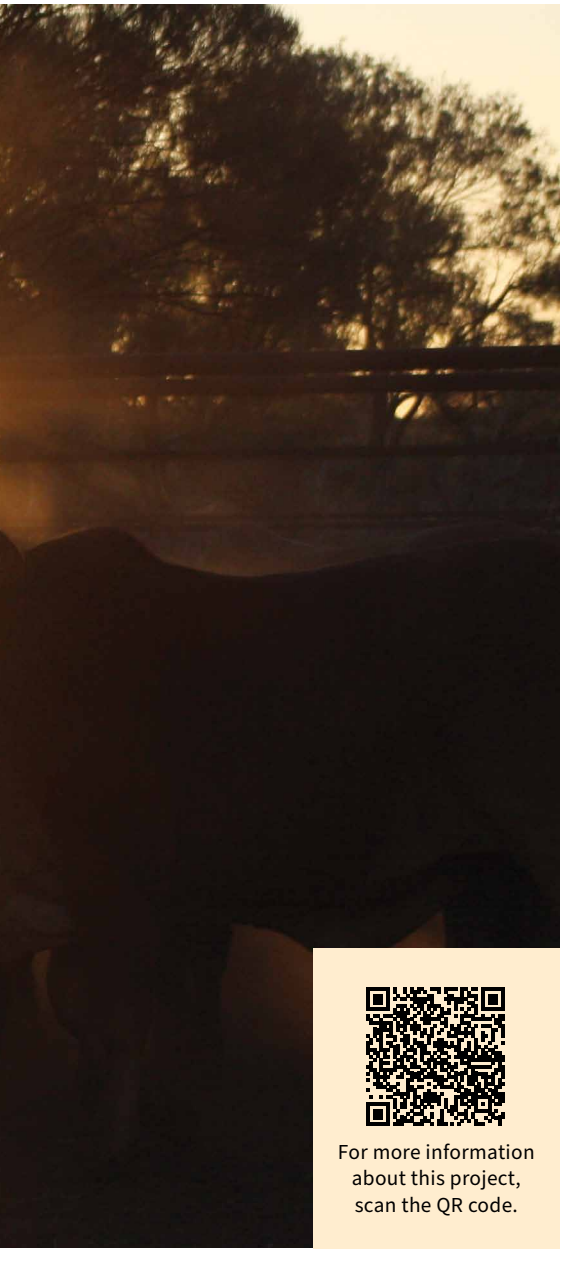
Additionally, flora and fauna data collected during this project will be shared with citizen science platforms, enhancing regional knowledge and supporting environmental research.

The project's success has led to further initiatives and funding applications to develop a mobile satellite monitoring unit, leveraging the learnings from the past 18 months.

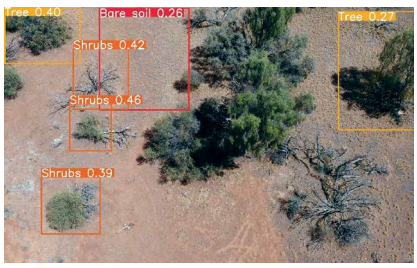


Cattle at Challa Station. Photo: Debbie Dowden

Weather stations, soil moisture probe installation and point to point cameras were installed and deployed at four project sites at Challa Station. Photos: AxisTech



For more information about this project, scan the QR code.



The application of machine learning in object detection and identification can contribute significantly to the preservation of the unique ecosystem of Challa Station. Vegetation/Landscape classification (top) and animal identification (bottom). Photos: AxisTech

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Southern Rangelands PASTORAL ALLIANCE

AXISTECH
DATA | DEVICES | SUSTAINABILITY

CHALLA STATION

Supporting the adoption of biodegradable mulch technology in vegetable and perennial fruit enterprises

Project Lead: Department of Primary Industries and Regional Development (DPIRD)

For more information about this project, scan the QR code.

Project overview

The southwest of WA is experiencing declining rainfall, increasing temperature and greater frequency of extreme weather events. In horticultural farming systems, changes to management practices can support adaption to these challenges, especially through the adoption of innovative technologies.

This project explored the suitability of CSIRO's innovative Sprayable Biodegradable Polymer Membrane (SBPM) technology to improve irrigation efficiencies, reduce herbicide and plastic use, and maintain healthy soils in horticultural systems.

The key objective of this project was to support the profitability and sustainability of southwest WA horticultural producers by promoting the adoption of SBPM across multiple crops.

This project also aimed to challenge traditional farming practices and foster a mindset open to innovative technologies in response to a drying and warming climate.

The trials compared SBPM with conventional practices, considering factors like relative advantages, compatibility, complexity, trialability, and observability to assess its adoptability.

Impacts and Results

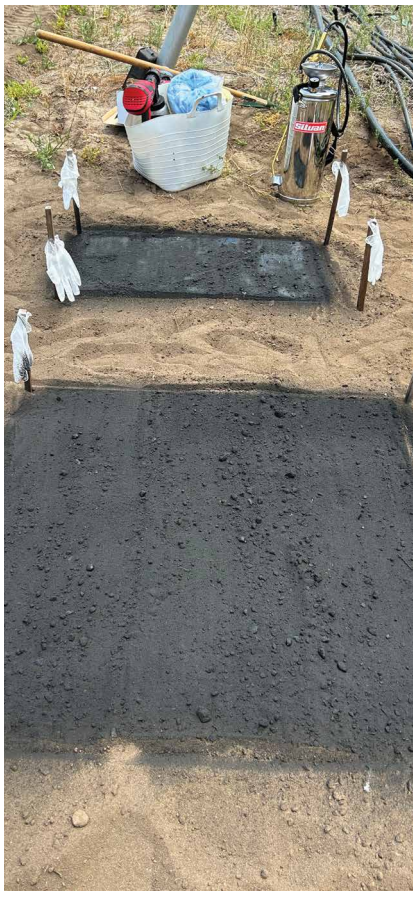
This project successfully demonstrated SBPM technology across nine trial sites, fostering strong awareness in southwest WA's horticultural industries.

However, challenges, including application volume, equipment compatibility, and unknown costs due to the product not being commercialised yet, hinder SBPM's current adoption.

Insights were shared with CSIRO to assist in the further advancement of the formulation to overcome these challenges.

The project was successful in prompting conventional growers to consider the role new technologies may have in supporting their adaptation to climate change.

> Growers were particularly interested in SBPM's potential to increase irrigation water efficiency and reduce reliance on herbicides.



Prior to applying treatments at demonstration sites, a practice application was conducted on sandy soil at DPIRD's South Perth facility. Lessons learnt from these practice applications aided the methodology development of the consequent demonstration sites. Photo: DPIRD

A piece of SBPM-soil debris film 4 months post application. Photo: DPIRD

SBPM demonstration in a Swan Valley table grape vineyard. Photo: DPIRD

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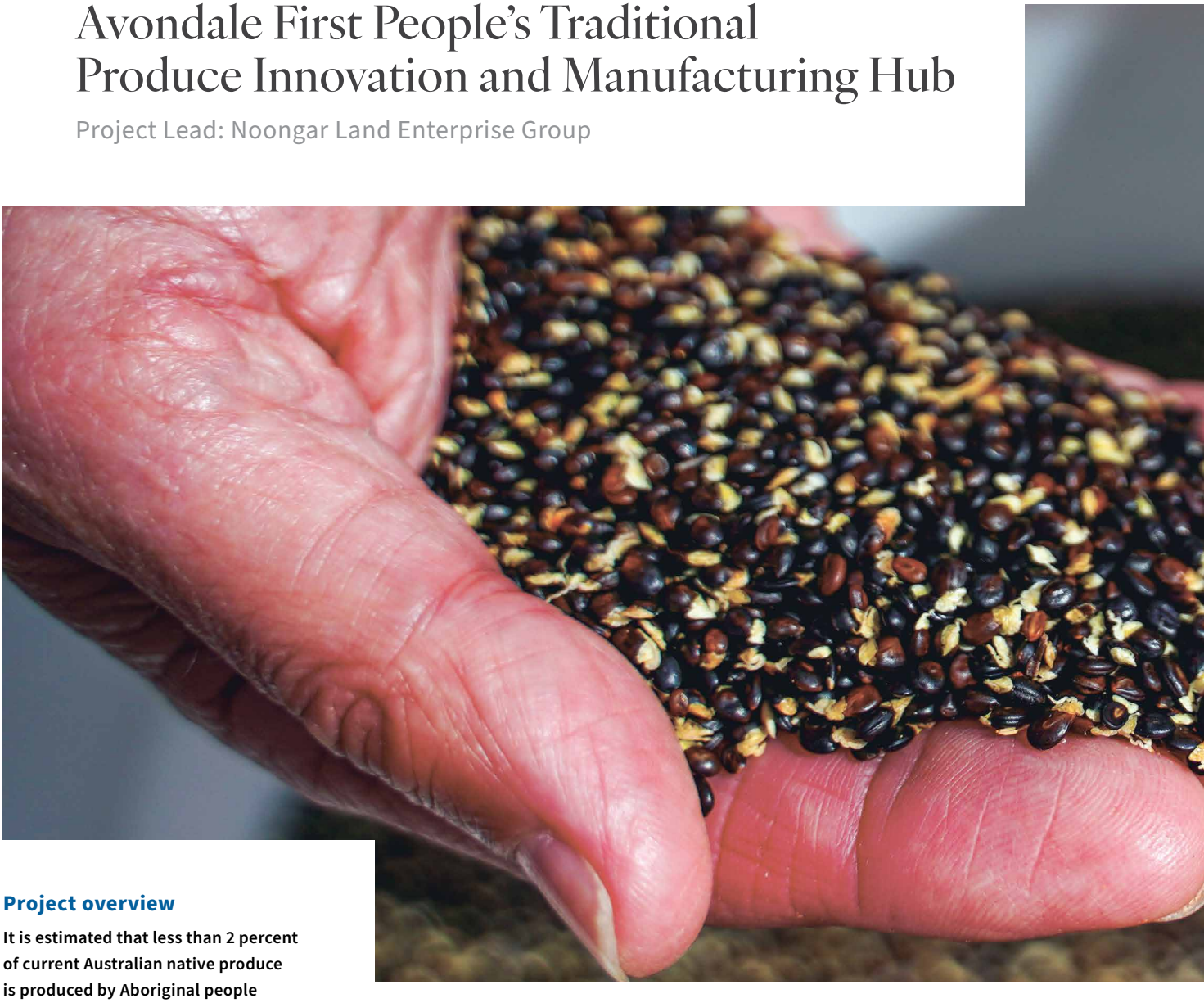
Department of Primary Industries and Regional Development, Government of Western Australia

CSIRO

Avondale First People's Traditional Produce Innovation and Manufacturing Hub

Project Lead: Noongar Land Enterprise Group



Project overview

It is estimated that less than 2 percent of current Australian native produce is produced by Aboriginal people or businesses.

The aim of this project was to address the underrepresentation of Aboriginal and Torres Strait Islander people in the Australian native produce market. Through the establishment of the Avondale Bush Food Innovation Hub, the project aimed to develop the capacity of Noongar Land Enterprises (NLE) to commercially harvest and sell food-grade quality wattle seed, the first Noongar organisation to do so.

This project facilitated ongoing research and development of wattle seed products, a more expansive wattle seed harvest in late 2022/early 2023, and equipped NLE to produce raw and roasted food-grade quality wattle seed products. This marks a significant step toward cultural sustainability, economic empowerment, and market representation for Aboriginal communities in the native produce industry.

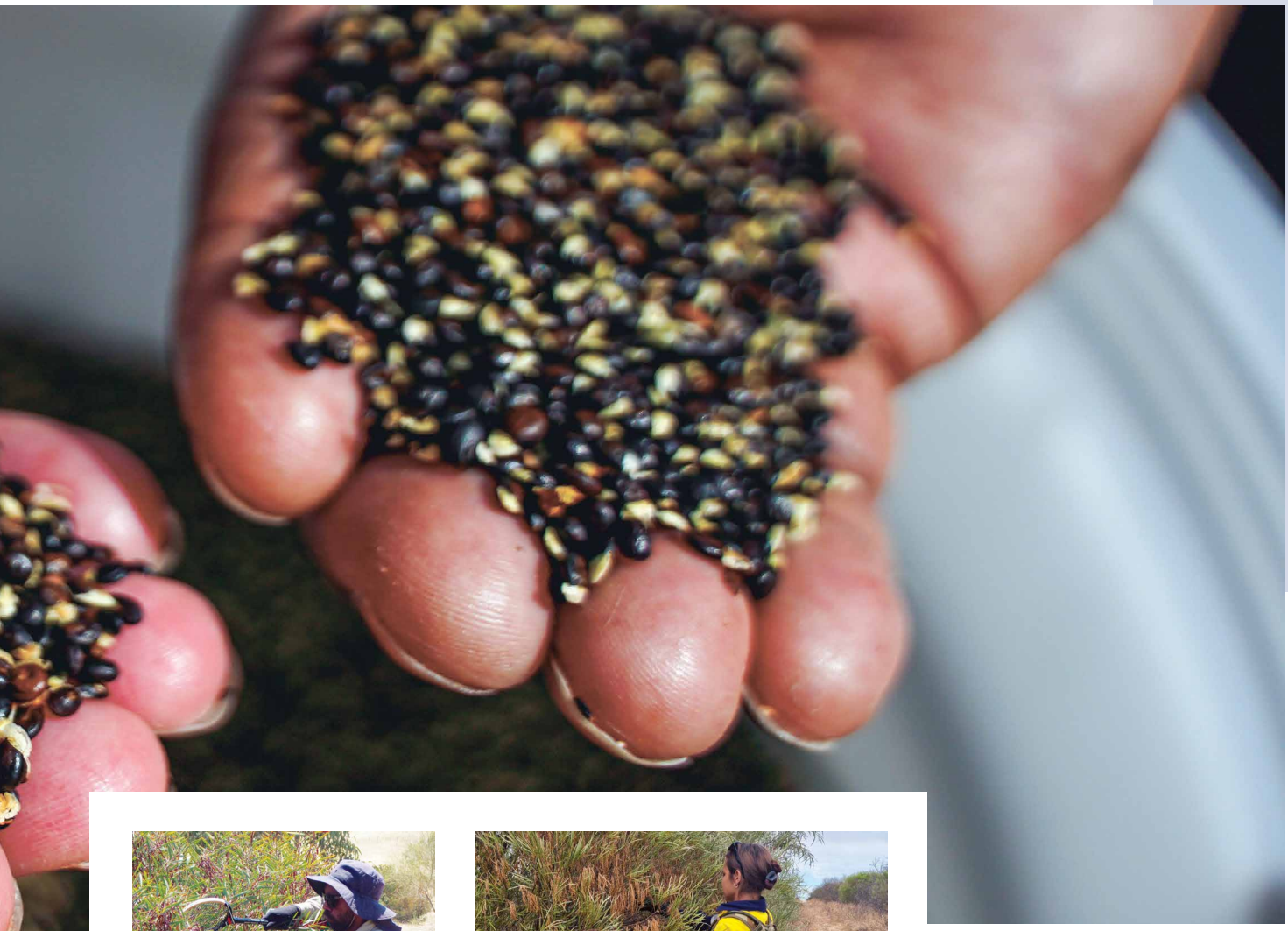
Impacts and Results

This project enabled NLE to research the properties of six species of wattle seed, trial new harvest protocols, clean and produce commercial quantities of raw seed, roast and ground wattle seed for commercialisation to both home consumers and the hospitality/catering industry.

The branding work developed by NLE focuses on the products' authenticity, First Nations heritage, provenance, and sustainability. Specific branding examples remain confidential until the official product launch in mid-2024.

This project places NLE in a prime position to take the next step towards producing transformative products for niche markets overseas whilst catering to the domestic market in Australia.

Alan Beattie, CEO of the Noongar Land Enterprise Group (NLE), and Oral McGuire, Noongar leader, NLE member and Chairperson of Yaraguia Enterprises Inc. and Vice Chairperson of NLE. Photo: Jessie Collins



(above) Wattle seeds.
Photo: Jessie Collins

(left) The project team used various techniques to hand harvest the wattle seed.
Photo: NLE

For more information about this project, scan the QR code.

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Noongar Land ENTERPRISE GROUP

COMMONLAND
4 RETURNS FROM LANDSCAPE RESTORATION

Wide Open Agriculture

Agtech Decoded: growers critically analysing the role of new technology in on-farm decision making – what are the possibilities?

Project Lead: Liebe Group

Photo: AGSOCIAL

For more information about this project, scan the QR code.

Participating growers were equipped with soil moisture and weather monitoring technology to monitor their focus paddocks. Photo: AGSOCIAL

Liebe Group growers and WildEye staff standing in front of soil moisture probes at Brad McIlroy's property. Photo: Liebe Group

Project overview

A range of technologies have been developed in the agricultural industry that provide growers with new insights into their farm businesses and have potential to improve efficiencies and productivity. However, these technologies often have limitations and farmers often lack the time, tools and skills to process data from multiple different sources to effectively utilise them.

This project was designed to assist growers to better understand the opportunities presented by the latest digital technologies and how they can address farming system challenges and improve in-season decision making when faced with a variable climate.

The project monitored fourteen paddocks equipped with soil moisture and weather monitoring technology, and combined the data collected with CSIRO technology and digital farm records. The integration of these technologies enabled real-time decision-making, allowing growers to promptly address agronomic issues and optimise yields in paddocks with limited water-potential.

Impacts and Results

The Agtech Decoded project has enhanced on-farm resilience by implementing digital technologies, improving management practices, and fostering a more interconnected community among farmers, researchers, and industry representatives.

Surveys and workshops conducted as part of the project revealed that farmers are willing adopters of technology, using an average of seven different digital tools. Weather information and climate forecasts were highly sought after, while challenges included data integration and data interpretation issues, and the lack of technology support. Technologies with a clear use case and value proposition were more valued by growers, particularly for critical management decisions related to crop planting, nutrition, soil management, and pest control.

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Paddock level carbon benchmarking

Project Lead: Farmanco

Project overview

This project developed an online carbon calculator (G-GAF) for both broadacre cropping and livestock, using the University of Melbourne Greenhouse Accounting Framework, which was integrated into Farmanco's cloud data capture and benchmarking platform.

While a significant volume of data is produced by agricultural machinery systems and proprietary software, this data is not readily available for integration with other platforms for broader applications.

A second goal of the project was to trial bringing a more granular and automated approach to gathering data from broadacre farming buisnessess. This was achieved by intergrating grower data from the John Deere Operations Centre via API. This data can be used by farmers for determining best practice, profitability, or sustainability measures at an individual paddock level, rather than enterprise level, beyond the initial purpose of the data.

The overall objective of the project was to streamline data collection and calculation processes, offering insights into business performance, profitability, and carbon emissions.

Impacts and Results

As Australia endeavours to reduce its carbon footprint, it is crucial for industries to understand their emissions.

The creation of this combined cropping and livestock carbon calculator has simplified the carbon audit process for mixed enterprises. Leveraging existing benchmarking data, the tool gives farmers a comparative view of their business emissions within their peer group. This information can be used to explore emissions reduction best practices.

The enhanced calculation capabilities of the calculator have bolstered the adoption of carbon audit from Aglytica's general benchmarking activities.

> Aglytica observed a 9.8% increase in businesses conducting CO2 audits from season 2022 (223 audits) to season 2023 (245 audits).

Farmanco's Profit Analyser. Photo: Farmanco

For more information about this project, scan the QR code.

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FARMANCO

AGLYTICA

AEGIC Barley Malt Quality Biochemist, Dr Qisen Zhang, was instrumental in the development of the MultiMalter. Photo: AEGIC

The MultiMalter has been assessed to provide $12 million of value to the industry in the next decade.

For more information about this project, scan the QR code.

Reducing technical barriers for malting barley market access using innovative technology

Project Lead: Australian Export Grains Innovation Centre (AEGIC)

Project overview

Rapid turnover of new varieties of Australian malting barley (export and domestic maltsters) is a major concern for domestic and international customers. Processing to evaluate the functionality of new varieties and determine how to best malt each new variety costs industry and maltsters significant time and money.

To address this concern and provide consistent returns to farmers and processors, the Australian Export Grains Innovation Centre (AEGIC) designed and developed the 'MultiMalter', an innovative laboratory-scale malting prototype.

Unlike conventional micromalters that test one malting protocol at a time, taking seven days per test, the MultiMalter can simultaneously assess six different protocols. The prototype integrates all micro malting functions, including steeping, germination, and kilning. This advancement enables malt houses to accumulate the equivalent of six weeks' worth of data in a single week, facilitating quicker approval of new barley varieties and more efficient resource allocation.

Impacts and Results

The fabrication of the MultiMalter unit has been completed and final testing continues. The work to date has been accepted and approved by the Malting and Brewing Industry Barley Technical Committee (MBIBTC) as producing consistent results with comparable and current micromalting units.

Finding a local engineer to build a prototype in Western Australia can be challenging due to the scarcity of skilled professionals, but the collaboration with DSM Consulting Engineers proved highly beneficial to this project. This is attributed to their nuanced understanding of local regulations, the convenience of proximity for effective communication, and the potential for fostering long-term partnerships that facilitate iterative improvements.

The outcomes from this project will be evaluated over time, evolving as new barley varieties are released and additional data is generated for Australian malt and malt barley users. However, a Benefit Cost Analysis has calculated a net benefit of $12.22 million (NPV at 7% social discount rate) spanning over a decade.

Barley grain in the MultiMalter. Photo: AEGIC

Malted barley. Photo: AEGIC

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aegic
Australian Export Grains Innovation Centre

AEGIC is an initiative of the Western Australian State Government and Grains Australia

Next generation agribusiness analytics for the Eastern Wheatbelt

Project Lead: Curtin University

Project overview

Farmers are acutely aware of current and future risks to production posed by a drying climate. However, they often lack clarity over the 'how and when' to adopt changes to production systems.

This project aimed to enhance climate resilience in the eastern wheatbelt of WA by helping farmers and agronomists use farm data to improve profitability and sustainability at paddock, farm, and farm enterprise scale.

The project team developed an interactive app, the Yield Profitability Research Dashboard, which integrates yield data produced by agricultural machinery with economic models. The tool allows the visualisation of yield data by paddock alongside paddock statistics and weather observations, production data, profitability analysis, and the probability of yield exceedance.

The dashboard is a comprehensive tool for researchers to collaborate with farmers and advisors to understand within-paddock variability. It supports the diagnosis of yield constraints, associated management practices that may overcome them and the likely return on investment of any treatments applied.

Impacts and Results

Collaborating with growers in the eastern wheatbelt amplified the social impact of this research, fostering knowledge sharing between regions and connecting the lead farmers and agronomists through a community of practice.

The creation of the Yield Profitability Research Dashboard and codesign process demonstrates the business case for the development of a commercial capability to visualise and analyse within paddock variability. It is a foundational step in the establishment of a new Food Agility CRC research project, Agri Analytics Hub, which aims to make data-driven decisions easier for farmers. This project is a collaboration between CCDM (Curtin University), DPIRD, NGIS and Farmanco to develop opportunities to visualise within paddock variability, experiment, analyse results and predict return on investment and risk. The cohort of participants in this project will transition into the next project.

A cohort of farmers and their agronomists participated in a co-innovation workshop in the Pawsey Supercomputer Data Visualisation Laboratory. Pictured are Project Lead, Dr Julia Easton, and farmer Clint Della Bosca. Photo: Arnold Salvacion

Project Lead, Dr Julia Easton, and Pawsey Supercomputing Research Centre CEO, Mark Stickells, had the opportunity to present the project to Science Minister Stephen Dawson MLC. Photo: Aditi Suramanya

This project aimed to enhance climate resilience in the eastern wheatbelt of WA by helping farmers and agronomists use farm data to improve profitability and sustainability at paddock, farm, and farm enterprise scale.

For more information about this project, scan the QR code.

Curtin 4 Agribusiness Profitability (C4AP) team at the Pawsey Supercomputer Data Visualiation Lab, June 2023. L-R Arnold Salvacion, Kai Bagley, Julia Easton, Matthew Ngyuen. Photo: Jesse Helliwell

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WA Agricultural Innovation Ecosystem

Identifying the composition of an agricultural innovation system within Western Australia presents a formidable challenge. The system involves a multitude of participants, ranging from farmers, researchers, agribusinesses, customers, and policymakers, each contributing to its complexity. It resembles solving an intricate puzzle, requiring a comprehensive understanding of the roles and interactions among various stakeholders.

Attempting to outline the system provides a clearer understanding of the system's structure and operation, aiding in targeted interventions and resource allocation. The Grower Group Alliance (GGA) has built a dynamic database of over 500 innovation players in the Western Australian agricultural sector and adjacent industries to increase their visibility. These insights foster collaboration and enable stakeholders to devise tailored strategies to address challenges and leverage opportunities.

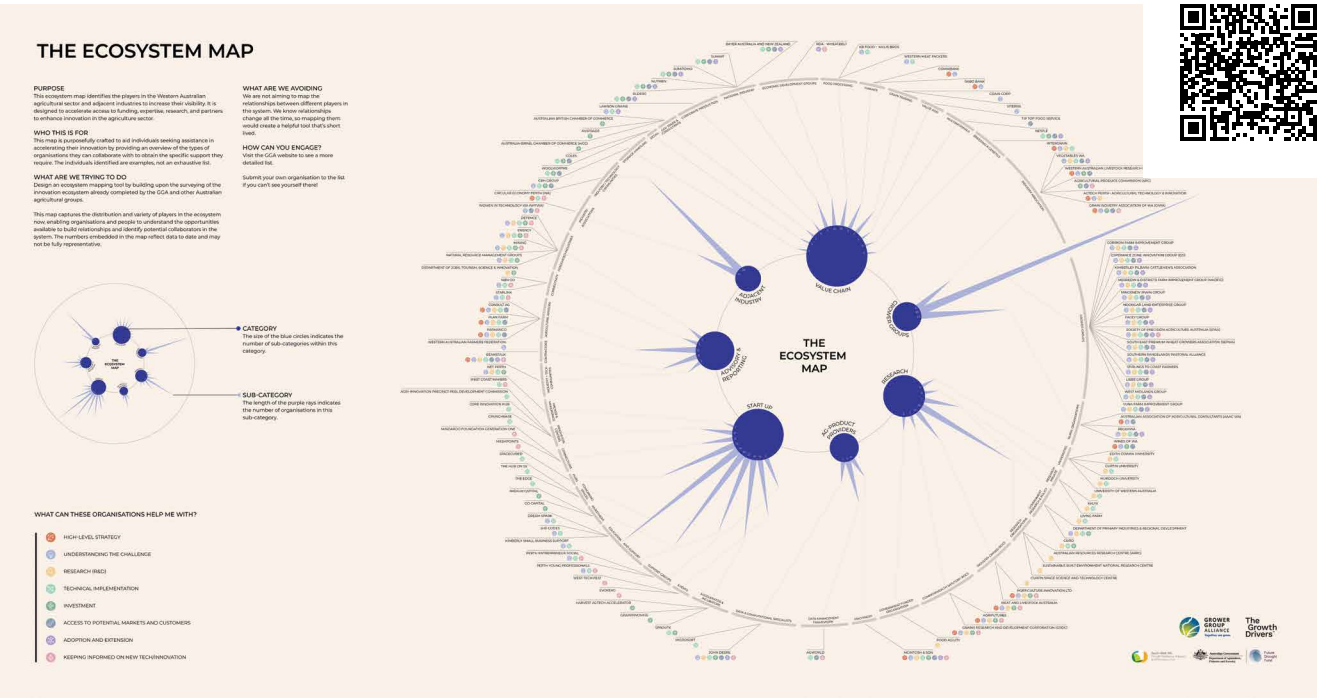
The database is organised into a hierarchy of categories crafted to aid individuals seeking assistance in accelerating their innovation. It does so by providing an overview of the types of organisations they can collaborate with to obtain the specific support they require.

The novelty of this approach is that the database is a tool to help different players in the innovation ecosystem connect purposefully with one another. The database has a facility to identify what this entity might be able to provide to a collaborative project including high-level strategic advice, understanding of the challenge, research and development capabilities, technical implementation prowess, options for investment, access to potential markets and customers, adoption and extension support, and keeping informed with new technologies and innovations.

To visualise the complexity, we have taken a subsection from each category and displayed these in a static map. The individuals identified are examples, not an exhaustive list, and we invite you to add your details to our database if they are missing by scanning the QR code and scrolling to the Master Directory.

Scan the QR code to keep up to date with our innovation projects, and to partner with us.

This activity signifies a significant step towards data-driven decision-making to build collaborative projects and underscores GGA's commitment to leveraging technology for industry advancement.



The Open Innovation Model

Open innovation, introduced by Henry Chesbrough in 2003, challenges the traditional mode of corporate research by emphasising the use of internal and external ideas to fuel organisational innovation. This approach represents a departure from traditional R&D logic, encouraging external collaboration. It offers benefits such as reduced research costs, faster time to market, increased market differentiation, and new revenue streams. Open innovation is a non-linear, complex, and iterative process that fosters information sharing and collaboration internally and externally.

The boundaries between organisations and their environments become more permeable, allowing innovations to transfer between them, impacting producers, organisations, industries, and societies. In the context of agriculture, facing changing climates and volatile markets, adopting open innovation is imperative for efficiency and collaboration in addressing evolving challenges. Operating in silos is no longer productive or cost-effective; embracing new collaborative models is essential for resilience and adaptability in agriculture.

Chesbrough, H., & Bogers, M. 2014. Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. In H. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), New Frontiers in Open Innovation: 3-28. Oxford: Oxford University Press. Page 17.

The Triple Helix Model

The Triple Helix Model facilitates open innovation in agriculture, proposing a simplified framework encompassing academia (university), industry, and government. Introduced by Henry Etzkowitz and Loet Leydesdorff in the 1990s, this model envisions interactions between these sectors, each represented by a helix, fostering economic and social development. Universities focus on basic research, industries on commercial goods production, and governments on market regulation. These interactions spawn intermediary institutions like technology transfer offices and science parks, showcasing the model's adaptability in explaining and promoting collaborative innovation.

This central role is a natural fit for the Grower Group Alliance. The phrase "a solution looking for a problem" is often associated with agriculture. This stems from technological developments sitting in a silo away from the user experience. Embracing the concept of open innovation through collaboration facilitated by the triple helix can bolster innovation in agriculture. Such a program should emphasise collaboration between industry, government, and academia to drive innovation.

"The Triple Helix Concept". Stanford University Triple Helix Research Group. 11 July 2011.

Grower Group Alliance and Innovation

The Grower Group Alliance (GGA) is a pivotal force in integrating open innovation methodologies to support Western Australia's innovation ecosystem and deliver farmer-led solutions. As a grower-led organisation connecting various stakeholders, including governments, research institutions, industry, and farmers, GGA uniquely drives open innovation in agriculture.

GGA's strategic pillars focus on innovative research, capacity development, and industry connections, collaborating with the state government for breakthroughs in agriculture. With a dedicated focus on fostering an innovation ecosystem in WA, GGA actively links networks, connecting innovators and agriculture community needs. This approach ensures capturing and consolidating valuable links, allowing GGA to act as a central hub, facilitating collaborations, and fostering innovation within the agricultural ecosystem. This strategic lens provides a streamlined approach for seizing opportunities and making meaningful connections throughout the triple helix model.

Open Innovation in Action

The Grower Group Alliance (GGA) actively engages open innovation through various projects such as the Agrifutures Water Quality Testing Technology Project. GGA is leveraging collaboration with grower groups, Beanstalk AgTech and The University of Western Australia to consider on-farm monitoring of water quality in relation to herbicide efficacy and to explore options to help farmers make best practice choices regarding water use for spraying. Taking the key principles of Open Innovation, this project demonstrates an alternative model to traditional siloed agricultural research. It takes a producer-led challenge as identified by the South-West WA Drought Resilience Adoption and Innovation Hub priority setting process for climate responsive projects and seeks to develop tailored solutions to WA farmers.

For more information on the Water Quality Testing Technology Project, scan the QR code.

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