Final report

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Australian Macadamia Industry Innovation and Adoption Program

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Public summary

The project delivered a coordinated program of phenologically relevant, best practice resources and targeted industry information to support informed decision-making. This was reinforced through capacity building, engagement activities, practical assistance and industry representation in response to emerging regional issues.

The Australian macadamia industry has undergone a period of rapid growth and change over the life of the MC20000 project. Expansion in planted area, increasing global supply and strong market demand have been accompanied by a series of significant challenges, including declining farm gate prices, rising production costs, variable seasonal conditions and increasing pressure on orchard productivity and profitability. Despite these challenges, the industry has maintained its position as one of Australia's most valuable horticultural sectors, producing a premium product that is highly valued in global markets.

Rapid industry expansion (~10% CAGR from 2018-2025) has highlighted the need for stronger support systems, including extension, data, advisory capability and coordination of research and development. It has also driven more complex and differentiated needs across the industry, particularly among larger and corporate operations requiring capability in areas such as compliance and workforce management and training. The project has provided a primary and highly valued mechanism to support these diverse requirements through independent, industry-focused extension and coordination.

Over the course of the project, the Australian Macadamia Society (AMS) delivered a comprehensive program of extension, engagement and industry development activities. These resources were located on a centralised platform, collated and maintained by the AMS and extended through several communication channels. Project resources developed included 62 monthly MacAlerts, 20 Bulletin editions, 24 videos, 4 podcasts, 40 factsheets and substantial content for communications channels such as social media, electronic direct messages and consumer stories. Capacity building and engagement activities included 48 MacGroups across 6 major growing regions, 24 field days, 12 workshops and training events, AusMac2022 and AusMac2024, consultants' meetings, Grower Liaison Officer (GLO) events, a range of industry reference groups as well as domestic and international industry representation.

These activities were regionally relevant and phenologically timed, with delivery aligned to R&D outcomes and topical issues to support practical, decision-ready information at critical points in the production cycle. The project evolved in response to changing industry needs, with a stronger focus on strategic industry development and coordination of R&D. This shift recognised that improving productivity and profitability depends on a more coordinated and informed industry, where research is actively translated into on-farm decisions rather than isolated practice change

As a result, growers and industry stakeholders have improved their knowledge, confidence and decision-making, leading to better on-farm outcomes and increased resilience in the face of ongoing challenges. The project has also strengthened industry alignment, improved access to consistent and reliable data, and enhanced the connection between research and on-ground practice.

The foundations established through this project have positioned the Australian macadamia industry to better respond to future challenges, improve productivity and maintain its competitiveness in a growing global market. They have also strengthened the industry's capacity to manage climate variability and build resilience, supporting more adaptable and informed decision-making across a range of seasonal and market conditions.

Keywords

Macadamia; industry development; extension; innovation and adoption; grower capability; productivity; kernel quality; sustainability; industry data; R&D coordination

Introduction

The Australian macadamia industry has undergone a period of rapid change over the life of the MC20000 project. What began as a phase of strong expansion and confidence has, over the past five years, shifted through a series of production, market and environmental challenges that have tested the resilience of growers and the broader industry.

At the same time, the industry has strengthened its position as one of Australia's most valuable horticultural sectors. For most of the project life, macadamia has been the highest value horticultural export out of both Queensland and New South Wales, supporting regional communities and contributing significantly to local economies. As the world's original home of macadamias, Australia continues to produce a premium product that commands premium position in global markets, underpinned by strong quality standards, innovation and a commitment to sustainable production. The industry is widely regarded as a leader in horticultural production, sustainable land management and industry collaboration.

Industry planted area has more than doubled over the past decade, with more than 20,000 hectares added since 2020. The industry now comprises approximately 800 growers across eight major growing regions, covering around 46,500 hectares, with approximately 38,000 bearing hectares. At the same time, global macadamia supply has continued to expand at pace. Global macadamia compound annual growth rate (CAGR) is roughly 7% and Australia's share of global production has declined to 13% in 2025 despite ongoing domestic growth.

While this expansion created opportunity, it coincided with a period of increasing pressure. Growers faced a combination of declining farm gate prices, rising input costs, labour constraints, sustainability expectations and a series of years of extreme and unseasonal weather. Production outcomes became more variable, particularly in regions with an ageing orchard profile. These challenges highlighted underlying structural issues, including fluctuating orchard performance, gaps in data and decision-making tools, and increasing exposure to production and market risk.

Over this period, the difference between potential production and realised production became more apparent. While the structural capacity of the industry has continued to grow, yields have not consistently met expectations. This reinforced the need for improved adaptive capacity, national scale action, better data, and stronger alignment between research, extension and on-ground decision-making.

The project was designed to support the industry through this period by strengthening grower capability, improving access to relevant and practical information, and ensuring that R&D outcomes are meeting industry needs and aligned to the Macadamia Strategic Investment Plan (SIP). Building on previous investments in innovation and adoption stewarded by the Australian Macadamia Society (AMS), the project has focused on delivering regionally relevant extension, facilitating collaboration across the value chain, and improving grower skills, productivity and adaptive capacity. Risks and the impacts of extreme weather were mitigated through the adoption of improved practices.

Importantly, the project has evolved in response to changing industry needs. During delivery, toward a more whole-of-industry approach, with increased focus on kernel quality, sustainability, industry data and forecasting, and coordination of R&D investment was made. This repositioning recognised that productivity and profitability required more than individual practice change and increased growing resources. It also required a more coordinated, informed and aligned industry.

The project has supported growers and industry stakeholders to make more informed decisions, adapt to changing conditions and build greater resilience within their businesses. It has also contributed to stronger industry alignment, improved communication and a more consistent approach to addressing key challenges.

As the industry moves forward, it does so with a clearer understanding of its strengths, its constraints and the actions required to improve performance. While challenges remain, the foundations established through this project place the industry in a stronger position to respond, adapt and remain competitive in a growing global market.

Methodology

The project was designed and delivered as an integrated industry development program, combining extension, resource oversight, engagement and research coordination to support improved productivity, sustainability and industry capability.

Delivery framework

The project was structured around four core areas of activity: industry development, industry resources oversight, industry engagement and representation, and R&D coordination. These areas were delivered in a coordinated way to ensure that extension activities, industry priorities and research outputs were aligned and mutually reinforced (Figure 1).

Figure 1: MC20000 delivery framework

Figure 2: MC20000 extension model

Extension model

Delivery was underpinned by a regionally targeted, phenologically based extension model, aligned to the macadamia production cycle. This approach ensured that information and engagement activities were timely, relevant and directly linked to on-farm decision-making.

The delivery model followed a continuous cycle of advice from project reference groups (PRG's), industry reference groups (IRG's) and advisory groups from each major growing region. Planning based on a developed national extension strategy. Extension delivery throughout each year guided by an annual operating plan and regular review including monitoring and evaluation, PRG consultation and Hort Innovation liaison (Figure 2). This enabled activities to remain evidence-based, responsive to seasonal conditions, emerging issues, aligned with industry priorities and synergistic to industry needs and other core projects such as the Communications project (MC18000) and Benchmarking project (MC18002).

Industry engagement and targeting

The project engaged stakeholders across the macadamia value chain, with a primary focus on growers. Engagement was designed to be accessible and relevant across a diverse grower base, while also supporting advisors, consultants and extension providers to ensure consistency of technical messaging. Broader engagement included processors, researchers, agribusiness and service providers to support alignment across the industry and strengthen collaboration. Each target audience had extension activities tailored to their characteristics, needs and engagement levels.

Delivery mechanisms

Regional, peer-to-peer engagement through MacGroup meetings, field days, workshops and major industry events.

Development and distribution of visual, written and auditory production resources including MacAlerts, Bulletins, fact sheets, videos, podcasts and case studies.

Creation and curation of industry data and resources, including annual reporting, Bulletin columns, season summaries, industry mapping, and centralised information platforms.

Targeted skill development through workshops, masterclasses and training activities.

On-farm demonstrations and showcases to support practical understanding, ag tech, automation and innovation.

Refined industry messaging and feedback based on R&D outcomes, including advisory forums including GLO forums, consultants/advisors' meetings, R&D PRG's, AusMac, SIAP, steering groups, and research provider meetings.

Integration and coordination

A key feature of the project was the integration of extension, industry engagement and research coordination. Activities were aligned with industry investments, including communications and benchmarking projects, to ensure consistency of messaging and efficient use of resources. The project also supported the translation of research into practice by working with researchers and stakeholders to identify relevant outcomes and communicate them in practical, accessible ways.

Measurement approach

Project performance was monitored through a combination of engagement metrics, participation levels, stakeholder feedback and evidence of practice change. This included attendance at events, use of resources, industry feedback and observed changes in knowledge, confidence and decision-making. This approach provided a practical and fit-for-purpose method of assessing impact in a complex and variable production environment.

Results and discussion

Project delivery at scale (2021-2026)

The project delivered 62 monthly MacAlerts, 20 Bulletin editions, 24 videos, 4 podcasts, 40 factsheets and substantial content for communications channels such as social media, electronic direct messages and consumer stories. Capacity building and engagement activities included 48 MacGroups across 6 major growing regions, 24 field days, 12 workshops and training events, AusMac2022 and AusMac2024, consultants' meetings, Grower Liaison Officer (GLO) events, a range of industry reference groups as well as domestic and international industry representation.

Together, these activities provided consistent, industry-wide support and contributed to improved access to information, stronger networks, increased engagement and productive outcomes across the macadamia industry.

Industry context and operating environment

The project was delivered during a period of significant change for the industry, characterised by rapid expansion alongside increasing production, market and environmental pressures. This coincided with a period of declining farm gate prices, rising input costs and a series of challenging seasons marked by extreme and unseasonal weather events. The global industry continued to expand at a more rapid pace that Australia, decreasing our production contribution and increasing the need for provenance positioning.

Project evolution and repositioning

The project was initially delivered through an extension and capacity building model, focusing on grower engagement, practice change resources and skills development. While these activities remained important, it became evident during the first half of the project that a broader approach was required to address emerging industry challenges.

In response, the project underwent a repositioning in 2023 supported by the PRG and Hort Innovation. This shift recognised that improving productivity and profitability required greater emphasis on industry-wide coordination, improved data and stronger alignment between research and extension. Increased focus was placed on kernel quality, industry data and forecasting, sustainability and environmental management, and coordination and translation of R&D investment. Additional resourcing was needed in key growth areas in Queensland and provision was made for this with the appointment of an Industry Development Officer based in Bundaberg.

Productivity and orchard performance

Improving productivity remained a central focus of the project, with activities targeting key drivers of orchard performance including integrated orchard management, harvest efficiency, integrated pest and disease management, improved kernel quality practices and resource use efficiency. Through targeted extension, demonstration activities and consistent messaging, growers improved their understanding of the relationship between management practices and production outcomes. This included greater awareness of the factors influencing yield variability and the importance of timely and well-executed orchard operations.

Kernel quality

Kernel quality emerged as a critical area of focus during the project because of its direct impact on saleable recovery, viable returns to growers, market ability to expand and premium global positioning. Analysis and industry consultation identified clear opportunities to improve recovery, reduce losses and strengthen profitability. Project activities highlighted the extent of losses from pest damage and the strong relationship between spray coverage, calibration and management decisions on kernel quality outcomes. Late in the project, residue issues also emerged, requiring support for food-safe on-farm practices, processor consignment protocols and broader market access risk management. These drivers led to targeted extension and training through workshops, demonstration activities and consistent messaging across MacGroup meetings, Bulletins, MacAlerts and advisory forums.

Integrated pest and disease management

The project supported improved approaches to integrated pest and disease management, with a strong focus on sustainable and cost-effective approaches and environmental stewardship. Activities and resources promoted improved monitoring, enhanced decision-making with regard to chemical/biological/cultural options, better spray timing and coverage as well as a more integrated view of orchard ecology, including consideration of beneficial species, pest suppressive landscapes and broader biodiversity goals. Engagement with pest consultants, researchers and growers supported more consistent and informed approaches to managing pest pressure. Significant supporting functions with regard to industry chemical access, regulation, co-ordination and best practice extension took place to align the industry to more sustainable, public and consumer conscious expectations.

Sustainability and environmental management

Sustainability and environmental management were strengthened through resource development, industry engagement and representation. The project supported communication of sustainable practices including soil health management, improved groundcover, resource use efficiency, waste reduction, runoff management and spray drift risk mitigation. Engagement with Reef initiatives in Queensland and Clean Coastal Catchments in New South Wales supported practical and regionally relevant environmental management. Chemical stewardship, MRL awareness and residue management were also key areas to underpin kernel quality and market access.

Industry data and decision-making

Substantial progress was made in improving industry data collection, alignment and use. The project facilitated collaboration across organisations including ABS, APVMA, DAFF, ABARES, LRS, NRS, WMO, INC, Hort Innovation, processors and handlers. Alongside this, foundational data was provided to projects or publication such as Hort Stats Handbook, Yearbook, crop forecasting, and benchmarking systems to improve consistency and reliability of industry data. Outputs such as the tree crop mapping, Macadamia Yearbook, season summaries, yield curve analysis, Bulletins and improved production data collection mechanisms supported improved forecasting, planning and industry alignment.

Industry capability and engagement

The project had high levels of engagement across all major growing regions through MacGroups, field days, workshops and major events. These activities supported peer-to-peer learning, knowledge sharing and increased confidence among growers and advisors. Consistently strong participation and positive feedback indicate that these platforms were effective in supporting capability development and information exchange. Activities were regionally focused, delivered with local context and specific challenges or needs in mind.

R&D coordination and dissemination

The project played a central role in improving the coordination and visibility of R&D activities across the macadamia industry. The development and maintenance of a research register and ongoing engagement with research providers supported improved understanding of current research activities and reduced duplication. Industry consultation processes ensured that research priorities were informed by on-ground needs. Research outcomes were translated into practice through field days, MacGroups, Bulletins and MacAlerts, supporting grower relevance and adoption.

Industry resilience and future positioning

Collectively, the project contributed to improved industry resilience and adaptive capacity. Growers and industry stakeholders are better equipped to respond to seasonal variability, market pressures, increasing regulatory burden and other emerging challenges such as biosecurity events and water quality initiatives. Improved access to decision-useful information, stronger industry alignment and more effective coordination of research and extension have strengthened the industry's ability to adapt and respond. Businesses are more able to adapt to tightening gross margins but this remains a challenge in light of global events, competition and disruptions.

Outputs

The project delivered tangible outputs across four core areas. These outputs were designed to provide practical support, strengthen industry capability, improve access to information and align R&D outcomes with grower and industry needs.

Table 1. Output summary

Output	Description	Detail
Industry Development	Targeted activities and initiatives to improve on-farm performance, productivity and long-term industry capability, aligned to priority areas identified by the PRG: kernel quality, industry data & forecasting and sustainability.	36 targeted workshops, field days or technical sessions were delivered to address priority areas, alongside integration of key messages across extension activities, resources, data analysis and reporting. **Kernel quality.** Delivery of focused workshops and extension on spray coverage, calibration, drone spraying, pest and disease management, and orchard rejuvenation with emphasis on improving grower understanding of factors impacting kernel outcomes and value as well as profitability. This includes kernel recovery assessments, improved procedures and quality standards as well as engagement with residue management issues. **Industry data and forecasting.** Development and communication of industry data resources including season summaries, yield trends and forecasting insights, alongside collaboration with ABS, DAFF, ABARES, Hort Innovation, Hort Stats Handbook, WMO, INC, processors/handlers, crop forecasting and benchmarking programs to improve data consistency and availability. This includes improved industry mapping, regional analysis and “mapping spatial hub” development - housing grower tools like the predicted planting year,

		industry engagement and severe weather apps. These supported knowledge of crop outcomes, seasonal influences, adaptive practices and planning. **Sustainability.** Extension and engagement on environmental management, resource use efficiency, collaboration on sustainability metrics, regulatory requirements, alignment with Reef (QLD) and Clean Coastal Catchment (NSW) initiatives, supporting improved awareness of compliance, risk management and long-term sustainability practices. Additional activities included targeted workshops and training in orchard floor management, pest and disease management, spray application, integrated orchard management (IOM) more generally, and orchard rejuvenation. Whole-of-industry information was compiled to showcase industry evolution with regard to improved practices, social license consideration and positive environmental outcomes.
Representation & Engagement	Facilitation of industry collaboration, coordination and representation across stakeholders, regions and priority issues	**MacGroups.** Delivery of 48 MacGroup meetings across six major growing regions (Bundaberg, NSW Northern Rivers, Glasshouse Mountains, Gympie, NSW Mid North Coast, and Clarence Valley), with a total of 3,143 attendees. MacGroups provided practical, on-farm learning, peer-to-peer engagement and demonstration of best practice. **AusMac.** Delivery of major industry events including AusMac2022 and AusMac2024 (~1300 attendees combined), showcasing research, innovation, ag tech and machinery in addition to topical plenary sessions/workshops, networking opportunities and industry visioning. **Consultant Forums.** Regular facilitation of GLO events, consultant meetings to get industry feedback, R&D priorities and align best practice. **Advisory mechanisms.** Regular regional advisory engagement, supporting two-way information flow in industry. Coordination and support of PRG's, industry steering committees, and SIAP processes. **Domestic engagement and representation.** Participation in processor field days, regional tours, innovation forums and other industry or agricultural development events. Representation nationally on priorities including local and regional councils/planning, state and federal initiatives, regulatory bodies, peak bodies, consultative forums and development activities. Active engagement in issues such as biosecurity, disaster response/preparedness, crop protection, chemical access, food and farm safety, environmental and regulatory processes, market access, innovative tech, workforce capability, skills development, climate adaptability and crisis management. **International engagement and representation.** International forums including the WMO, International Macadamia Symposium, INC keeping abreast of macadamia industry and world trends, latest R&D, sustainability and innovation. Collaboration on international initiatives to improve global macadamia industry outcomes.
Industry Resources Oversight	Development, curation and delivery of practical, accessible industry resources to support knowledge, decision-making and consistency of	**MacAlerts.** 62 MacAlerts developed and distributed monthly from March 2021 to April 2026. It provided a phenologically based overview of production with topical links, relevant alerts for industry and regularly covering pest & disease, crop inputs, mechanical issues, management topics and outlooks. In the project there were 66,800 total distributions, reaching approximately 1,079 industry participants per issue, with an average open rate of ~65%. Resource links within MacAlerts connected readers with resources from over 25 different levy and non-levy funded R&D projects.

	information	**Fact sheets.** 43 fact sheets developed or updated (25 new, 18 updated). Audience focus was largely growers at an operational level, however the resources also covered managerial and executive audiences through higher-level data and whole-of-industry relevant publications. These highly regarded, relevant resources covered topics including orchard management, pest and disease management, chemical stewardship, sustainability, IOM, kernel quality, harvest and a range of industry practices. **Bulletins.** Content for 20 Macadamia Bulletin editions contributed to by the project. Covering best practice, case studies, industry data, emerging issues, innovation and current information, this publication is the go-to-resource for information pertaining to R&D projects and other levy investments in industry. During the project, editions covered Winter 2021 to Autumn 2026 with an average distribution of 755 copies per edition. **Videos and podcasts.** 24 videos and 4 podcasts developed to support visual and accessible learning and an alternate method to written formats to accommodate audience preferences and intake capability. Both long and short format videos were delivered based on content requirements and included topics such as orchard management, pollination, industry and marketing data, industry season updates, case studies, pest and disease management and chemical stewardship. The podcasts received between 604 and 714 plays (as at reporting date) and covered topics such as biodiversity, pest and disease management, pollination and orchard management. **Centralised platform.** Development and maintenance of a centralised AMS resource platform, including improved website functionality, structured resource library, improved curation and integration of tools such as weather and climate tools. Web resources aligned to production cycle and emerging issues, including regional and seasonal updates.
R&D Co-ordination	Coordination, alignment and dissemination of research and development outputs to ensure relevance, reduce duplication and improve adoption of outcomes	Development and maintenance of a macadamia research register to improve visibility of R&D activities across levy and non-levy funded research. Coordination of and contribution within PRG processes and industry consultation to inform R&D priorities. Participation in research steering committees, industry reference groups, project evaluations, reviews and scoping of new investments. Engagement across all research areas including breeding and genetics, pest and disease management, pollination, production systems, water quality, nutrition, crop forecasting and yield modelling, benchmarking, sustainability, automation, chemical access, innovative technology, conservation, leadership, extension and biosecurity. Hosting research presentations, posters and other interactions at specifically designed forums during AusMac conferences. Collaboration with researchers, government agencies and industry stakeholders to align priorities and reduce duplication. Translation of research outcomes into practical extension through MacGroups, field days, MacAlerts, fact sheets, Bulletin publications, videos and podcasts. Support for international collaboration and knowledge exchange.

Outcomes

Outcome 1: A more profitable, efficient and sustainable industry

Alignment with SIP Outcome 2: Supply, productivity and sustainability

KPI: Increased knowledge and adoption of sustainable and best management practices

Over the life of the project, growers and industry stakeholders have strengthened their decision-making through improved access to practical information, more consistent industry data, and targeted extension.

Improvements have occurred across a range of core production and business areas, including kernel quality, pest and disease management, spray practices, orchard management, sustainability and use of industry data. Through industry consultation, targeted extension and consistent messaging, growers and advisors have strengthened their understanding of how on-farm practices influence productivity, quality and profitability. This has been supported through practical activities, advisory engagement and integration of key messages across events, resources and forums, contributing to more informed decision-making and improved on-farm outcomes.

Significant progress has also been made in industry data capability. Improved industry data collection, alignment and sharing across organisations including ABS, ABARES, Hort Innovation and benchmarking systems has led to more consistent and reliable industry data. This has supported improved forecasting, business planning and alignment across the industry. The industry data suite developed through the project has been adopted as a standard reference for the macadamia, further supporting more informed decision-making at farm, industry and sector levels.

Sustainability outcomes have been advanced through the development of industry sustainability approaches, alongside engagement in environmental management, chemical stewardship and regulatory processes. Growers have been supported with practical guidance on input use, environmental risk and compliance, helping maintain market access and the industry's premium positioning. These activities have also strengthened the industry's ability to respond to increasing expectations around sustainability and social license.

Together, these changes demonstrate a shift towards a more informed, data-driven and quality-focused industry, better positioned to improve productivity, reduce risk and maintain global competitiveness.

Table 2. Outcome 1 Key Highlights

Industry outcome area	Highlight	Example activity
Production and quality	Stronger focus on practices that influence yield, quality and sustainability	On-farm demonstrations, MacGroup discussions and practical sessions. Bulletin articles focused on yield kernel quality and sustainability. Case studies of high-performing or innovative farms and practical guidance to support Australia's premium position. Videos and podcasts on production topics in an easy to consume format.
Pest and disease management	Improved understanding and management approaches	Reinforcing robust monitoring as an industry standard and extending protocols, pest and disease updates through MacAlerts, and timely extension supporting, agrichemical resources, threshold information, integrated management decisions including promoting beneficial activity and bolstering biodiversity
Spray practices and chemical stewardship	Improved handling, product choice and IPM-based decision-making, alongside application, coverage and timing	Spray calibration and coverage workshops, MacAlert guidance, fact sheets and Bulletins supporting product choice, timing, monitoring, and responsible use

Integrated orchard management (IOM)	Increased understanding of principles across drainage, canopy and orchard floor to support productive, resilient orchards	Field days, case studies and fact sheets covering drainage, canopy and orchard floor management, supported by MacAlerts linking practices to seasonal conditions
Data and industry information	More consistent and reliable industry data available	Grower participation in mapping and benchmarking, contribution to industry datasets, and contributions to highly regarded publications such as Yearbooks and Season Summaries
Forecasting and planning	Improved ability to forecast and plan at farm and industry level	Industry crop estimates, yield curve analysis, and seasonal outlooks used by growers and industry for short and long-term planning
Business decision-making	Better use of information to support farm decisions	MacAlerts supporting timing of key operations, "month ahead" guidance, and use of industry information in farm level decisions. Bulletin articles showcasing better farm practices and outlining commercial examples
Sustainability	Increased awareness and uptake of sustainable practices	Adoption of ground cover, cover crops, improved spray practices, nutrient budgeting, run-off management, erosion control, biodiversity and beneficial species importance all supported through practical extension and case studies
Environmental management	Improved understanding of environmental risks and responsibilities	Workshops and demonstrations on runoff, erosion control, spray drift mitigation and catchment protection, including Reef and Clean Coastal Catchments engagement
Residue management (MRLs)	Improved understanding of domestic and export MRL requirements and compliance	Communication of National Residue Survey results, guidance on MRL requirements, and support for on-farm compliance decisions. AMHA adoption of AMS best practice guidance
Market access and positioning	Maintenance of premium market access and reputation	Quality and compliance sessions with processors, export market updates
Industry alignment and understanding	Greater consistency in how information is collected and used, alongside improved awareness of industry performance and direction	Use of shared reporting tools such as the Yearbook, consistent data approaches, and alignment of information across industry and sector organisations

Outcome 2: Increased industry capacity and a stronger culture of innovation

Alignment with SIP Outcome 3: Extension and capability

KPI: Improved grower capability, decision-making and participation in industry development

The project has strengthened industry capability through consistent, regionally relevant engagement and improved access to practical information and peer learning opportunities.

MacGroup meetings, field days, workshops and major events like AusMac2022 and AusMac2024 provided regular opportunities for growers, consultants, researchers and industry stakeholders to connect, share knowledge and learnings. These events have maintained strong attendance across all growing regions and consistently high satisfaction ratings, solidifying their value as a trusted extension platform. In addition, field days, machinery showcases and demonstration activities highlighted new ag tech, automation and supported practical consideration of innovation on-farm. Participation grew over the life of the project, with more than 3,100 attendances recorded at MacGroups alone.

These engagement activities have supported measurable improvements in grower knowledge, confidence and decision-making. Growers have demonstrated increased preparedness and adaptability in response to challenges such as seasonal variability, pest pressures and market conditions. Practice change has been supported through targeted extension across key production and management areas.

The project has also strengthened the broader extension and advisory network. Engagement with consultants, grower liaison officers and researchers has improved the consistency and quality of advice reaching growers. At the same time, the coordination of R&D activities and increased visibility of research has supported greater awareness and uptake of new technologies and practices.

A more structured and collaborative advisory framework has been established, improving the flow of information between growers, industry and Hort Innovation. This has ensured that industry priorities are clearly communicated and that R&D investment is better aligned with on-ground needs.

Collectively, these outcomes have contributed to a stronger, more connected industry with an increased capacity to adopt innovation, respond to challenges and drive ongoing productivity improvements.

Table 3. Outcome 2 Key Highlights

Industry outcome area	Highlight	Example activity
Industry engagement and information	Strong participation across regions with access to timely updates, trends and region-specific information	MacGroup meetings, MacAlerts, Bulletin articles, region-specific alerts before key phenological phases
Grower capability, decision-making and practice change	Improved confidence and on-farm decision-making, with adoption across key production areas	Hands-on workshops such as spray calibration and canopy management, supported by on-farm demonstration sites and field days that show practices in context. Ongoing guidance through MacAlerts and Bulletin content reinforces timing and decision-making across the season, while improved access to practical AMS resources supports growers to apply and adapt practices
Advisory and extension network and consistency of advice	Stronger alignment between advisors and growers, with improved quality and consistency of technical advice	Consultant, GLO and adviser meetings, alignment sessions on key topics, and post-event resources supporting consistent best practice messages
Innovation and ag tech adoption	Increased exposure to and consideration of new technologies	Machinery demonstrations, AusMac presentations, and grower-led trials of new tech and practices
Research awareness	Greater awareness of R&D outcomes and their relevance	Regional or topical groups, PRG engagement, and structured grower input into industry priorities and project direction
Industry networks and long-term support structures	Stronger industry networks and advisory mechanisms supporting collaboration and decision-making	SIAP, regional groups, PRG sessions, IRG's, grower panels all feeding into investment priorities. MOU with Hort Innovation on advisory structures
Industry voice and governance	Communication of industry priorities into decision-making, and a consistent industry story to external stakeholders	Use of industry reporting such as the Yearbook and season summaries, and coordinated communication with partners to support consistent messaging
Industry culture and leadership	More progressive industry with strong participation, ongoing improvement and horticultural leader status	Grower participation in MacGroups and field days, peer-to-peer learning, and industry showcases that highlight practical innovation and leadership

Outcome 3: Improved coordination and impact of R&D investment

Alignment with SIP Outcome 2 and 3. KPI: Improved relevance, coordination and adoption of R&D.

The project played a central role in improving the coordination, visibility and relevance of macadamia R&D across levy and non-levy investments. The development and ongoing maintenance of a comprehensive macadamia research register has provided industry and Hort Innovation with a clear view of current research activities. This has supported better prioritisation, reduced duplication and improved alignment of projects with industry needs.

Project staff have been actively involved in the scoping, review and coordination of a wide range of R&D initiatives across a wide range of priority industry areas. This has strengthened the connection between research and industry, ensuring that project outputs remain relevant and accessible to growers.

Improved advisory and engagement mechanisms have supported more effective two-way communication that is often lacking. Industry consultation has directly informed research priorities, while extension activities have ensured that research outcomes are translated into practical, usable information. International collaboration has also been strengthened, supporting knowledge exchange and positioning the Australian industry within the global context.

As a result, R&D investment is now better coordinated, more aligned with industry priorities, and more effectively translated into practice, increasing the impact of research for growers and the broader industry.

Table 4. Outcome 3 Key Highlights

Industry outcome area	Highlight	Example activity
Research coordination and priorities	Clearer, industry-led direction for research investment	Clear, industry-led research priorities guiding investment and effort. SIAP engagement, structured grower and industry consultation to set priorities, and Project Reference Group involvement to guide project direction
Research visibility and communication	Improved visibility of research and clearer extension of findings and outcomes	Greater visibility of active research and clearer communication of results. Maintained research register, and plain-language summaries of projects and results shared through MacAlerts, fact sheets and the Bulletin
Efficiency and investment decisions	More strategic and aligned investment across projects	More coordinated and strategic investment across projects and priorities. Cross-project mapping and gap analysis, coordinated review processes, and SIAP prioritisation supporting aligned investment and long-term planning
Project development and industry input	Stronger industry input shaping practical project design	Stronger industry input shaping practical, relevant projects. Co-design workshops with growers, consultants and processors, scoping activities that ensure practicality and relevance from the outset
Research translation and accessibility	Research translated into practical, usable guidance for growers for has on-farm impact	Research findings translated into practical actions that growers can apply. R&D outcomes shared through field days and MacGroups, supported by Bulletin articles, fact sheets and MacAlerts that translate results into on-farm practice
Collaboration and global positioning	Stronger collaboration supporting national and international industry connections, raising the tide of the industry	Stronger national and international collaboration supporting industry leadership. Participation in forums such as the International Macadamia Symposium, WMO and INC, as well as study tours supporting knowledge exchange

Relevance and adoption	Research better aligned to industry needs with growing uptake on farm	Research better targeted to industry needs, with increasing on-farm uptake. Feedback through MacGroups and PRGs used to refine research focus and priorities, with adoption supported through case studies, demonstration sites and observed changes in practice over time. Opportunities such as the Research Hub at AusMac to enhance grower-research collaborations.

Monitoring and evaluation

Evaluation approach

Monitoring and evaluation for the project was guided by a practical, fit-for-purpose framework aligned to the complexity of the macadamia production system and the diversity of industry stakeholders. The approach combined participation and engagement metrics, resource use and distribution, stakeholder feedback, industry consultation and observed changes in practice and decision-making.

The evaluation approach recognised that in a variable production environment, outcomes are influenced by factors beyond project activities, including seasonal conditions, market dynamics and regional variability. Evaluation therefore focused on industry patterns of change, improved capability and strengthened systems rather than individual attribution.

Participation and practice change

Over the life of the project, there has been a clear shift in grower knowledge, confidence and decision-making across key production and management areas. Through ongoing engagement, growers have demonstrated a stronger understanding of factors influencing yield and kernel quality, alongside more considered approaches to pest and disease management, environmental outcome consideration and the use of industry data in planning and decision-making.

There has been a noticeable shift in how growers are approaching management decisions. More growers are exploring a broader range of options beyond traditional chemical controls, old calendar-based management and reactive interventions. The industry standard is now moving toward more integrated approaches that recognise the value of natural systems in supporting orchard resilience and long-term health. There is increasing awareness of biodiversity importance and natural capital goals, with growers incorporating these into management thinking and planning. This is reflected in survey feedback and event evaluations, where growers increasingly request information on sustainable, biological and resilience-focused practices.

Industry engagement channels have also reflected growing interest in kernel quality and sustainability, with more open discussion, questions and on-farm action observed. While uptake varies across regions and businesses, there is a clear trend toward greater openness to change and willingness to trial new practices, including more biological approaches.

Participation data demonstrates sustained and consistent industry engagement throughout the project. MacGroups, field days and workshops were delivered across all major growing regions, with typical MacGroup attendance ranging from 30 to more than 100 participants per event. Major industry events such as AusMac2024 attracted approximately 600 attendees. MacAlerts were distributed monthly to an average of 1,079 industry participants, with consistently high open rates of 60 to 70 percent. Bulletin publications reached approximately 755 recipients per edition.

Industry engagement and satisfaction: MacGroups

MacGroup meetings remained the most consistently attended and highly valued regular extension activity delivered through the project. These regionally based, farm-focused events provided a practical platform for peer-to-peer learning, demonstration and discussion, supporting growers, advisors, researchers and industry stakeholders.

MacGroups were delivered in all major growing regions, including Bundaberg, Gympie, Glasshouse Mountains, Mackay, NSW Northern Rivers, NSW Mid North Coast, and Clarence Valley. In total, 3,143 attendees participated in MacGroup meetings. Bundaberg and Northern Rivers consistently recorded the highest attendance levels, with participation in Bundaberg increasing significantly over the life of the project.

Survey data collected from MacGroup participants indicates a high level of satisfaction and perceived value. On average, 71.6 percent of respondents rated MacGroup events as either Very Good or Excellent in terms of usefulness and relevance. Ratings of Needs Improvement remained low, averaging approximately 4 percent across the project period. Feedback consistently highlighted the value of practical, on-farm learning, peer-to-peer engagement, access to current and regionally relevant information, and opportunities to engage directly with researchers and advisors.

Activity relevance and effectiveness

Survey data collected through the industry communications program provided strong evidence of the effectiveness, relevance and trust in resources developed throughout the project. MacAlerts were identified as the most engaged and widely used resource, with 72 percent of respondents rating the usefulness of information as very good or excellent. They are also the most downloaded resource on the AMS website, reinforcing their role as a key delivery mechanism for timely, production cycle aligned information.

Bulletin publications were also highly valued, with 95 percent of respondents rating them as Good, Very Good or Excellent, and an average usefulness rating of 4.3 out of 5. Video content was similarly well received, with approximately two thirds of respondents engaging with video resources and rating them positively. Trust in AMS as an information source was strong, with 80 percent of respondents rating AMS information at 8 out of 10 or higher.

AMS resources and communications were considered effective in supporting awareness of levy-funded R&D, with more than two thirds of respondents rating them as highly or very highly effective in keeping up to date with research activities. Website engagement data further supports these findings, with 63 percent of respondents visiting the AMS website quarterly or more frequently. The primary reasons for visiting included keeping up to date with industry information, accessing resources and finding information about events such as MacGroups.

Across all channels, primary drivers of engagement were consistent. Respondents indicated they used project resources and AMS communication channels to stay up to date with industry information, gain new ideas and support changes or improvements in on-farm practices. These findings align with participation and engagement data across the project and confirm the effectiveness of a multi-channel approach that integrates digital resources with face-to-face engagement.

Industry-level outcomes and limitations

At an industry level, the project contributed to improved consistency and availability of industry data, stronger alignment between industry, research and extension, increased coordination of R&D investment, improved communication of industry priorities and strengthened industry networks. Outcomes were influenced by external factors including seasonal variability, extreme weather events, global supply and market conditions, input costs and regional differences in production systems. These factors reinforced the importance of the project in supporting industry resilience, adaptability and informed decision-making under variable conditions

Recommendations

1. Enhance industry data systems and decision support tools. Further development and integration of industry data systems is required to support forecasting, benchmarking and business decision-making.
2. Future projects should incorporate more robust and systematic approaches to measuring practice change, including longitudinal follow-up, targeted adoption indicators, investigating more practical approaches that better reflect the complexity of practice change and integration with benchmarking or industry data.

3. Maintain focus on kernel quality and productivity drivers. Prioritising kernel recovery, quality and productivity as key drivers of farm profitability. Extension and R&D efforts should remain focused on the practical factors influencing these outcomes, including pollination, nutrition, pest and disease management, and orchard variability. Demonstration of what works under different regional conditions will be critical.
4. Consolidate coordination and translation of R&D. Maintaining alignment between research priorities and industry needs is essential. Continued coordination and practical translation will support adoption, impact and viability.
5. Continue to build industry resilience and climate adaptability. Continued focus on practices and systems that improve resilience and adaptability is recommended, including water management, soil health and risk mitigation.
6. Strengthen capability and connection across industry development roles, supporting networking and collaboration among industry development staff across commodities to share approaches, tools and lessons.

Scientific references

None to report

Intellectual property

No project IP or commercialisation to report.

Acknowledgements

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Growers across the industry are recognised for their openness and willingness to contribute to industry development. This includes sharing their experiences, both successes and challenges, hosting MacGroups, field days and industry visits, supporting on-farm trials, contributing data and allowing their businesses to be used as practical learning environments. Their commitment to supporting others and advancing industry knowledge has been central to the success of the project.

Consultants are also acknowledged for their generosity in sharing knowledge and insights, and for their strong focus on collective industry improvement. Their willingness to contribute time and expertise has supported more consistent and informed advisory across the industry.

Grower Liaison Officers and the processors they represent are recognised as key partners in the project. Their role in providing regional insight, supporting communication, and collaborating on grower and industry initiatives has been critical in ensuring activities remain relevant and well targeted.

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Researchers are recognised for their commitment to delivering outcomes for industry. Their openness to input, responsiveness to emerging challenges and willingness to engage with growers and advisors to strengthened the relevance and adoption of research.

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Appendices

Project supporting documents or relevant documents are listed below. Further publicly available information is listed and also available on www.australianmacadamias.org/industry.

Examples of latest outputs are shown below, but as these resources are protected in Australian behind macadamia levy-payer only access platforms, a full list is not included.

Full output lists and links can be found in project milestone reports milestones 101 to 111.

1. Appendix 1 MC20000 Macadamia Extension Strategy Road Map
2. Appendix 2 MC20000 Macadamia Monitoring & Evaluation Plan
3. Appendix 3 2024 Season Data
4. Appendix 4 2025 Season Data
5. Appendix 5 2021 Australian Macadamias Yearbook
6. Appendix 6 2022 Australian Macadamias Yearbook
7. Appendix 7 2023 Australian Macadamias Yearbook
8. Appendix 8 2024 Australian Macadamias Yearbook
9. Appendix 9 2025 Australian Macadamias Yearbook
10. Appendix 10 April 2026 MacAlert (output example)
11. Appendix 11 Autumn 2026 Macadamia News Bulletin (output example)
12. Appendix 12 AMS IP Register