

**Macadamia Industry National on-farm
productivity Coordinator (NC)**

Kim Jones
Australian Macadamia Society Limited

Project Number: MC09009

MC09009

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Level 7
179 Elizabeth Street
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Telephone: (02) 8295 2300
Fax: (02) 8295 2399

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National on-farm productivity

Coordinator

Kim Jones

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Project Details

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Organisation:	Australian Macadamia Society
Postal Address:	1/113 Dawson Street Lismore NSW 2800
Administrative contact:	Michelle Lancaster Finance & Administration Manager Australian Macadamia Society Phone: 02 6622 4933 Fax: 02 6622 4932

Chief Investigator:	Mr Kim Jones
Address:	Formerly: Australian Macadamia Society 1/113 Dawson Street Lismore NSW 2800 Phone: 02 6622 4933 Fax: 02 6622 4932

Objectives of project: Improved on-farm efficiencies and quality through higher adoption rates of research recommendations. The general level of knowledge within the macadamia industry will improve through facilitation of communication and provision of training courses, seminars, workshops, and field days. The latest information will be made available and distributed to the industry in an efficient manner.

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Summary

This report details the role of the National On-farm Productivity Coordinator (NPC) in facilitating change in the macadamia industry. The NPC facilitates adoption of the outcomes from R&D projects with the aim of improving profitability and sustainability for the macadamia industry. The NPC is also responsible for developing and maintaining the Research & Development (R&D) program by facilitating R&D planning workshops and providing technical advice and guidance to the R&D committee and assisting and guiding researchers in project development. Through the NPC project, strong networking has been established within the pool of researchers engaged in macadamia research and many successful collaborative projects have been developed. The NPC is also responsible for maintaining other professional networks, for example the pest scouts and consultants network, the macadamia industry extension network, processor networks and international networks.

Technology transfer strategies used in the macadamia industry are based on the industry Communication plan (Baker 2000).

Products used to aid extension and adoption include:

- **The AMS News Bulletin**; produced every two months and mailed to all AMS members
- **The AMS website**; holds the industry reference database making information available in a searchable format 24 hours per day
- **The AMS E newsletter**; a monthly newsletter emailed to all AMS members and others who elect to receive it.
- **MacGroups**; are grower discussion groups where industry issues and research results can be discussed in a friendly environment
- **MacMan Best Practice groups**; data based comparative analysis groups organised on a regional basis
- **Field days**; held on a regular basis
- **AMS Annual general meeting and technical conference**; showcases the R&D and marketing programs to the industry
- **Numerous short courses and training**; depending on demand

- **DVD's**; detailing the practical use of research outcomes with testimonials and case study from early adopters.

Processes have been developed to ensure that the grower's levies, matched with commonwealth funding through HAL, are used in the most efficient manner. Regular consultation with AMS members occurs at various levels including discussions with growers at MacGroups, with pest scouts and consultants with processors at various levels including quality managers, grower liaison/field officers and CEO's, and researchers through industry steering groups where progress and future directions of projects are discussed.

As a direct result of the NPC project the AMS is viewed by industry stakeholders as the primary source of information, including agronomic advice, financial information, industry prospects, investment potential, etc.

Introduction

The primary role of the National On-farm Productivity Coordinator (NPC) is to facilitate change in order to improve productivity, profitability and sustainability of the macadamia industry. The NPC identifies and prioritises the information to be communicated, as well as identifying the most appropriate channels of distribution for that information. The NPC also assists with identifying gaps in knowledge and facilitates the development of that knowledge through R&D and adoption and commercialisation strategies.

Key objectives:

Develop and lead programs that:

- Facilitate on-farm changes in management and production systems
- Enhance information and technical expertise within the macadamia industry
- Raise grower awareness of industry issues and R&D priorities
- Provide technical advice to industry
- Assist with the implementation of Best Management Practice
- Support industry partnerships and capacity building
- Facilitate the development of the industry R&D program

Key Outcomes

- Improved farm productivity and profitability
- Improved macadamia quality
- Improved industry skills, knowledge and services
- Adoption of research recommendations, on-farm and in factories
- An efficient R&D program that addresses macadamia industry strategic objectives

Method and activities

There are several areas where the strategic development of communication links has assisted the industry. These have been underpinned by taking a whole of industry approach that involves processors, researchers and other support services such as pest scouts and consultants. The NPC facilitated the formation of a macadamia extension network that included processor field officers, departmental extension officers, TAFE teachers and consultants.

The NPC assists the Australian macadamia industry to be proactive when facing challenges, such as increasing restrictions on chemical use. The uncertainty of the availability of chemicals for future use in our industry makes it imperative that a strategic review of chemical use is conducted. Many of the chemicals used in the macadamia industry are older chemical formulations and are either under review or planned for review by the APVMA (Australian Pesticides and Veterinary Medicines Authority). It is also highly likely that Endosulfan will be withdrawn from market within a few years. The NPC arranged for Peter Dal Santo (Agaware Consulting Pty Ltd) to attend the annual pest scouts and consultants meeting and to conduct a strategic review of the chemicals used by the macadamia industry. The NPC distributed the relevant information before the meeting and coordinated responses and follow up actions. A draft confidential report has been produced and is currently being reviewed by the industry contributors.

The NPC organised, and lead, a study tour to the 4th International Macadamia Symposium in South Africa in September 2009. Seventeen participants, covering all sectors of the Australian industry including, farm management, nursery production, pest control and pest research, post harvest, processing, marketing, research and extension, travelled to South Africa to attend the 4th International Macadamia Symposium and conduct a study tour of the industry. The balance achieved in the team structure meant that maximum benefit was achieved for the Australian Industry. Numerous papers written by the team members were published in the AMS News Bulletin and team members also presented at the AMS Annual conference in Bundaberg and at regional MacGroups.

The NPC organised and chaired the bi-annual science seminar held in June 2009 at Brisbane technology Park. The science seminar day is an opportunity for researchers to forge links between projects and stay informed about the comprehensive macadamia R&D program funded through HAL and industry levies. About 50 researchers and industry leaders attended the seminar day and heard 16 short presentations from researchers and participated in discussions on industry R&D priorities and directions.

The NPC also plays a major role in establishing the technical program for the Annual Industry Conference. Based on grower feedback the format and structure of the conference has evolved significantly over the years. The preferred format is now a combination of plenary sessions and concurrent workshops. The concurrent workshops are aimed at delivering practical advice for farmers. At each workshop we endeavour to have the most recent research recommendations presented, backed up by a leading grower describing how they have implemented the recommendations and the benefit they receive. The 2009 conference was held in Bundaberg. The program included traditional plenary sessions, concurrent workshops and, for the first time, a conference in the field, where practical demonstrations were provided. The conference concluded with a bus tour of district farms. Farmers especially appreciated the conference in the field and one remarked, "I have learnt more in one day from this conference in the field than I have at all the other conferences combined". Over 250 delegates attended the conference making it one of the best attended conferences in recent years.

Most macadamia research projects funded through levies have industry steering committees. These steering committees keep the industry fully aware of progress and directions of the research project. Through these steering committees, the industry takes a greater ownership of the research. This leads to more practical outcomes that can, and are, more quickly adopted by stakeholders. The NPC either coordinates these steering committees or attends as a participant. Project steering committees include: the annual crop forecasting steering committee, the Macadamia Industry Varietal Improvement Committee (MIVIC). MacMan steering committee, canopy management steering committee, post harvest and brown centres steering committee.

The AMS conducts specific training sessions to improve adoption of best practice. The NPC arranged for Dorran Bungay, a process engineer from South Africa and recognised world expert in macadamia post harvest, to travel to Australia and conduct training sessions in February 2010. Three one day training sessions were held for growers, one each in Bundaberg, Nambour and Alstonville, and a three day advanced course in Alstonville which was targeted at industry advisors and engineers.

Evaluation

The NPC project utilises a wide range of media and targeted extension programs in the transfer of technology. The NPC plays a crucial role in the facilitation and implementation of research recommendations that drive production and income benefits to the macadamia industry. The objectives and outcomes of this project are aimed at long-term improvements in productivity and sustainability. It is not possible to determine the effect that this 12-month

project has had in achieving these long-term objectives and out comes, however, there have been specific outputs and achievements over the past 12 months that are measurable performance indicators. These include:

- 1) Fact sheet number 2. Drying Macadamia nut-in shell on Farm. Published by the AMS and widely distributed through the AMS, processors and other members of the macadamia extension network.
- 2) News Bulletin report Silo modifications to improve efficiency and macadamia kernel quality, AMS News Bulletin, March 2010
- 3) Australian Macadamia Video field Day 3rd edition
- 4) 100 growers and industry advisors attended Post Harvest Training courses run by the AMS and conducted by Dorrn Bungay in February 2010
- 5) Paper detailing Silo modifications to improve efficiency and macadamia kernel quality K Jones et al AMS News Bulletin Vol 38 No 2.
- 6) 17 HAL/VC funded participants attended the 4th international Macadamia Symposium in South Africa, September 2009. From this there were 8 publications detailing the lessons learnt, implications for the Australian macadamia industry and opportunities for collaboration, as well as presentations at the AMS annual conference and each regional MacGroup.
- 7) Consultations with members at MacGroups produced a list of research areas identified by growers. These were presented to the R&D committee for consideration during the priority setting and planning session and published in the AMS News Bulletin November 2009.
- 8) Draft SARP (Strategic agrichemical review project) Final report is currently being circulated among pest scouts and other contributors for final comment.

Industry Development is a long-term approach to enhancing the viability of the industry over an extended period. While the outputs from this project are quantifiable the effects of these outputs upon aspects such as kernel quality, productivity and access to improved chemicals and pest control will not be clear without several years of monitoring. What can be said is that after a 12-month concerted effort on post harvest care and kernel quality there is no doubt that growers are more aware of the issues. Anecdotal evidence suggests more growers are harvesting more frequently, using single pass rather than double pass. A random sample of NIS (Nut in shell) deliveries to one factory revealed that over 30% of consignments were delivered at moisture contents above 15%. This demonstrates that the

message about the risk of quality decline with extended on-farm storage is getting through. Previously growers would hold NIS in silos until the moisture content had been reduced to about 10%.

Processor representatives have been conducting on-farm inspections of silos and advising growers on changes in both structure and operations in order to improve quality. Since the Bungay post harvest training sessions a number of growers have expressed their intent to install Bungay drying systems.

The SARP report has recommendations and an action plan for the industry to consider and prioritise within the overall R&D expenditure. The outcomes from this report will not be obvious for some years to come.

Best practice is continually changing as a result of improved technology and knowledge gained from the R&D program, so at any one stage there will only be a few early adopters operating at the forefront of best practice. The challenge of the NPC project is to reduce the lag period between identifying new best practice and achieving wide scale adoption.

This current project has only run for 12 months, and while there were short term KPI's, all of which have been achieved, the primary purpose of the NPC project is continued and sustained improvement over a number of years.

Case Study: Establishment of macadamia extension network

As resources are dwindling in government departments and support for Horticulture is under pressure it is paramount that industries utilise all the available resources in order to achieve efficiencies in R&D, extension and adoption to ensure long-term profitability and sustainability. The macadamia industry is blessed with numerous professional advisors who can assist with adoption of best practice. In the past these advisors have largely operated independently. In early 2009 the NCP held a workshop with as many industry advisors as could be mustered. Participants included Field officers and Grower liaison officers from every major macadamia processing company, extension officers from QLD and NSW state departments, TAFE teachers, private consultants and AMS Industry Development Officers. At this first meeting agreement was reached that we would have an industry wide focus on achieving best practice in post harvest care and quality improvement.

During the first workshop the delegates drafted the first AMS fact sheet, Fact Sheet no. 1, Maintaining Macadamia Quality on-farm. This fact sheet was distributed to all AMS members through the News Bulletin. As well, the processors and other advisors distributed it to growers who were not members of the AMS and whom often fall outside the AMS communication links. The AMS included quality on the agenda at all MacGroups during

2009 and also at the Annual Conference. Some processors also held independent field days focusing on post harvest care, harvest frequency and silo management. This was the first time in the macadamia industry where a strategic, co-ordinated approach to adoption of best practice in a specific area had been attempted.

A second Fact Sheet, AMS Fact Sheet No. 2 Drying Macadamia nut-in shell on Farm was also developed with input from the extension network, and distributed through the same channels as Fact Sheet 1. This enabled the information to rapidly reach a much wider audience than would have been possible through the regular channels utilised by the AMS.

The adoption strategy culminated with training courses run by Dorran Bungay, an internationally recognised expert in macadamia post harvest care. 82 growers attended the one-day courses, 31 attended in Bundaberg, 22 in Nambour and 29 at Wollongbar, and 18 growers and other industry service providers including engineers, consultants and processor representatives attended the three day advanced course.

Quality management was also emphasised and given much greater in the Macadamia Production course conducted through the Wollongbar TAFE College. A guest speaker from a major processor was invited to the class to speak to students about the need for quality and how to maintain it.

After flooding the industry with the same consistent message from a number of different sources there is no doubt that macadamia grower's are now much more aware of quality management issues and management decisions they can make to improve quality and hence their financial returns. Processors have reported that many growers are now much more aware of the need for more regular harvests and do not hold NIS on farm for extended periods.

Implications

Strong targeting and clear messages are important for widespread practice change. Dwindling resources in the state departments with limited extension officers means that industries need to become more strategic with extension and adoption of R&D outcomes. The AMS has a plethora of information sources including the AMS News Bulletin, E-Newsletter, Website, MacGroups, Field Days and Annual Conference. While this is an impressive array of communication avenues there still remains the issue of reaching those growers who are not members of the AMS. By utilising the Macadamia extension network and working with these other professionals to develop a strategic approach to adoption of best practices, the effectiveness of the R&D program will be improved.

Recommendations

There are a number of important functions that are conducted by the NPC that should remain part of any future project. These include maintaining the networks with industry service providers, researchers, pest scouts, consultants; macadamia processors, their field officers and middle management, as well as international networks. The extensive use of communication channels, especially through the macadamia extension network, needs to be continued and refined under a revised communications plan and coordinated by the communications manager.

The industry communication plan identifies a need to develop ways of documenting the factors influencing end-users' decisions to adopt or not to adopt research recommendations. Greater emphasis should be devoted to this, and a report developed for every research project that recommends changes to management strategies. Wherever possible barriers to adoption should be identified in project proposals and a clear strategy to address these should be detailed before funding is approved.

Outputs from each R&D project need to be considered in the overall orchard management system and not in isolation. Reasons for a lack of adoption of research recommendations need to be understood and where necessary alternative incremental recommendations promoted. An example of this would be in silo management. Best practice would be to install state of the art Bungay systems, however alternative and less costly improvements can be achieved through improved management and minor structural changes to existing silos.

Barriers to adoption need to be understood and in some cases may require substantial investment to overcome. By working closely with farmers on steering committees, using farmers as advocates at field days and annual conference, promoting innovative thinking, supporting commercialisation, and by utilising all possible industry communication channels the best results from the levy expenditure will be achieved.

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