

AUSTRALIAN MACADAMIA SOCIETY

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NEWS BULLETIN

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"They are a trustworthy company that are doing a fantastic job" JOE BYFORD



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Front cover. George and Gerda Hobi planted their 32 ha macadamia orchard near Bundaberg in 2014. This year, after only 2 1/2 years, they harvested their crop and the results were impressive - average yield of 1.5 kg/tree NIS with an average SKR of 31%. *Photo: Paul Beutel.*

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OUR TEAM

Our Mission

The Australian Macadamia Society Limited is established to promote all aspects of the macadamia nut industry; to encourage a free interchange of ideas and information amongst macadamia growers and marketers of macadamia nuts and by-products; and to foster and promote goodwill among members of the Society in furtherance of its objects.



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CEO'S REPORT



The recent cyclone and associated flooding in macadamia growing regions along the east coast have had a terrible impact on many local communities. The thoughts of AMS directors and staff are with the many individuals and businesses that have lost so much including, thankfully, a relatively small number of orchards and macadamia-related businesses.

The AMS has always fought hard for prompt and appropriate disaster relief in these circumstances and this time was no different. The Queensland government moved quickly and generously and we applaud them for their consistent support of rural industries in disasters. The NSW government was, as usual, slower to come to a decision but in the end made more modest support available. If you would like advice or assistance regarding accessing government grants, please contact the AMS office. The AMS will continue to monitor the performance of government at all levels in these circumstances.

Fortunately, the damage to the industry as a whole has been moderate. The AMS has put out a revised crop forecast to the market adjusting the expected crop down around 4% from 54,000 t at 10% to 52,000 t. This is unlikely to have a material effect on the market, particularly as the South African crop is expected to bounce back somewhat this year.

I was invited by the Yunnan Macadamia Society to help them plan the 2018 International Macadamia Symposium. It will be held from 17 to 19 October in Lincang a city in Yunnan Province in the south of China. The program will include a dedicated researcher forum, as well as a tour from 14 to 16 October of orchards, a factory and nursery and other sites of interest. As more details emerge, I would encourage you to consider attending. While it may not be an international symposium like Australia and South Africa have held, it will be a macadamia experience with a very Chinese flavour and not to be missed.

You should have received your membership renewal recently. Over the last year, the AMS has been busy on your behalf promoting, supporting and protecting member businesses and the industry generally.

I hope you have all noticed the frequent and positive coverage we have been getting in the media, from *Landline* on the ABC to regional radio and newspapers. We have deliberately focussed on promoting responsible production by the industry and its ongoing growth and investment potential. This is aimed at supporting existing owners, encouraging new planting and providing an environment where those who are seeking to exit can do so with a good return on their efforts.

We have worked with governments at all levels and of all persuasions to improve outcomes for members on backpacker labour, disaster assistance, feral animal management, zoning and planning decisions and free trade agreements. These issues have a direct impact on your profitability and can rarely be managed by an individual business.

We have continued to work closely with Horticulture Innovation Australia to ensure that your levies are spent

on macadamia projects that are most likely to produce a practical result. The AMS management of the marketing program, an arrangement unique to macadamias and requiring continual work to maintain, has helped yield five years of year-on-year price growth. AMS lobbying on the HIA-imposed cap on matching funds for R&D has resulted in around \$500,000 of government funding staying in the macadamia R&D program.

All this activity comes at a cost. Previously the AMS did receive some funding from HIA to cover the work we did around levy-based programs to ensure the best result possible and accountability back to levy payers. This funding has been cut, but we are, of course, still doing the work. More positively the AMS continues to expand the services we offer, with new grower workshops, work on leasing and access to mill mud, and help with accessing grants for erosion control to name a few.

We are looking at a complete overhaul of the membership structure to one that recognises the different scale of members' businesses and reflects this in the service we offer and the fees that are paid. This will be put to members at the AGM in November after wide consultation.

In the meantime, we will be increasing membership fees to allow the AMS to further develop the support we provide. I believe membership will remain excellent value and I hope that you will agree. A strong, well supported industry body is essential to maintain the momentum and success we have enjoyed over recent years.

Jolyon Burnett

WHAT'S ON

DATE	EVENT	LOCATION	CONTACT
19 to 21 May	International Nut Conference	Chennai India	www.nutfruitcongress.org/chennai2017/
13 June	Queen's birthday	AMS office closed	
21 June	AMHA meeting	TBA	Phone 1800 262 426, office@macadamias.org
End July (dates TBA)	MacGroups	Nambucca, Lismore, Glasshouse Mountains, Gympie, Bundaberg	Phone 1800 262 426, office@macadamias.org

Don't forget

TO RENEW YOUR AMS MEMBERSHIP

Your AMS membership is due for renewal in June. The AMS needs your continued support to develop the industry and provide benefits for members.

In the past year we have worked with government at all levels on many issues for our members, including free trade agreements, seasonal workers, biosecurity, access to water, disaster assistance and planning.

We've developed and coordinated activities for growers and industry such as MacGroups and the 2016 Australian Macadamia Industry Conference and provided up-to-date information through our monthly e-newsletter, website and *Macadamia News Bulletin*. We have promoted our industry and growers to our local regions and the wider community through television, radio and print media.

And we have led and managed the marketing program, which has contributed to a year-on-year price improvement over the last five years,

Members will receive renewal notices with instructions on how to renew shortly.

The Australian macadamia industry is going from strength to strength and we hope you will continue on the journey with us.

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MARKET REPORT

Lynne Ziehlke, Market Development Manager

2016 delivers steady overall production despite challenging growing conditions globally.

The global macadamia crop for 2016 has been estimated at 179,998 t (at 3.5% moisture), representing a modest increase of 1.3% over the prior year.

Poor weather reduced the yields of many larger producers, particularly South Africa, which suffered a devastating drought. Australia, Guatemala and Brazil were the only established origins to increase their production at 8%, 2% and 8% respectively.

Reports indicate Chinese production for 2016 was around 8,500 t (at 3.5% moisture). Obtaining accurate statistics from this market continues to be a priority for the global industry.

Looking ahead, the 2017 crop is expected to deliver an increase in total production of between 5 and 8%, however, this is contingent on the residual impact of the South African drought and China's ability to increase production in line with its projections.

Overall kernel availability from the 2016 crop was similar to the year before at around 35,000 t.

Australian sales

Australian kernel sales were steady in the 12 months to March 2017, at just over 10,000 t (see table). Australian in-shell sales increased significantly, with continued strong demand from China and less supply available from South Africa.

The **domestic** market remained steady and continued to be the single largest market for Australian kernel at 31% of total kernel sales. The December quarter was especially strong in the lead-up to Christmas.

AUSTRALIAN IN-SHELL SALES INCREASED SIGNIFICANTLY, WITH CONTINUED STRONG DEMAND FROM CHINA AND LESS SUPPLY AVAILABLE FROM SOUTH AFRICA.

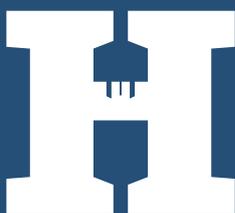
Australian kernel sales to the **US** were down over the last 12 months with the June and December quarters showing the most significant declines on a year-on-year basis. March quarter sales, however, returned to a level more consistent with previous years.

Sales of Australian kernel to **Japan** were particularly strong, up 26% year-on-year despite total imports to this market rising by just 1%.

Australian kernel sales to **China** are increasing, highlighting a steady escalation in opportunities for kernel in this market.

Australian kernel sales to **Germany** held stable, as did total sales to Europe. There was a notable drop in South African kernel imports to Europe due to constrained supply.

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Sales (MAT, April – March)					
	2013	2014	2015	2016	2017
Domestic	2,938	3,530	3,173	3,269	3,072
USA	915	1,359	1,277	1,405	622
Japan	1,583	1,322	1,390	1,574	1,980
Korea	na	19	394	398	638
Taiwan	na	39	661	466	470
China	na	38	482	408	624
Other Asia	1,857	1,551	852	749	745
Germany	761	913	1,097	875	930
Other Europe	516	515	706	855	682
Other	113	387	193	201	244
Total kernel sales	8,684	9,671	10,226	10,200	10,006
In-shell sales (3.5%MC)	1,294	1,787	10,350	12,235	15,687

Table. Sales of Australian kernel, April to March, 2013 to 2017.

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 Project MC 14005

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ROBBIE'S MACATTACK

Robbie Commens, Macadamia Industry Productivity Development Manager

The 2017 harvest is in full swing, and we wish all growers, processors and transporters the best for the entire season. Hopefully the bad weather is behind us now!

Unfortunately, the AMS office was a victim of the bad weather associated with ex-tropical cyclone Debbie, with over 2 m of water going through the ground floor. The staff were able to move most of our high value equipment, tools and resources up to the first floor before the office was flooded, but Debbie still left her damaging mark on us.



The AMS office after Cyclone Debbie flooding.



AMS storeroom post flood. Don't worry – new supplies before the next MacGroup! We won't use that esky or those drinks.

Fortunately, after talking to growers across all regions it seems that most were able to avoid any major damage. The most common issue mentioned was wash - of mulch and organic matter in the orchard and farm roads - which has resulted in significant economic loss.

The relatively good news is that most growers report very minimal tree and limb loss. This is a great

outcome considering the amount of rain that fell on the eastern seaboard.

And in more good news, while there have been accounts of some crop loss resulting from wash through orchards, most growers have reported minimal losses because of the timing of Debbie's arrival. Only a small amount of crop was on the ground when the cyclone struck, with most growers reporting that they had started harvesting and that most of the crop remained in the tree. The rain came in spades, but the wind stayed away in most areas, and that was a saving grace.

Formal crop forecast updates have been released, indicating that the Australian industry suffered an estimated 3.5 to 4% crop loss. This means that the original forecast of 54,000 t has been downgraded to 52,000 t (at 10% moisture). As strange as it is to say, possibly that is a good outcome from a terrible weather event for our industry.

Government assistance has been released across most macadamia growing regions, with loans and grants available for those who have been affected. If that is you, you can go to the NSW RAA or QRAA websites for more detail. You can also call them directly on NSW RAA 1800 678 593 and QRAA 1800 623 946.

MacGroup messages taken on board for 2017 harvest

The December 2016 round of MacGroup meetings highlighted the importance of having a well set up harvester, replacing bent and worn finger-wheel packs and communicating with your processor/s throughout the season. It seems that these messages were well and truly taken on board, with industry surveys indicating that finger-wheel sales have increased at most suppliers.

Keeping in mind that a potential loss of between 15 and 39% was identified during a hand harvesting trial conducted in 2016 (see article in the Autumn 2017 *News Bulletin*, page 38), if we were able to achieve a 5% increase in the 2017 crop harvested as a result of the improvements and modifications that you have all invested in this season, we may be able to still harvest another record crop in 2017 (the current record stands at 52,000 t at 10% last year).

Across the industry there has been a movement towards less bare soil and more organic matter and mulch in the tree rows of orchards. Unfortunately, Debbie moved some of the fruits of that hard work in the wrong direction. I can only imagine how frustrating it must be for growers to be faced with the challenge of replacing washed organic matter, mulch and soil back into the tree row. This can be a cruel part of agriculture – Mother Nature.

With such an incredible amount of rain falling in a short period of time, wash and damage were inevitable, however, with the drainage, canopy and orchard floor work (IOM) completed by growers across the industry the impact was less than it could have been. This is backed up by the conversations I have had with people across the industry, who have stated that they expected the damage to be worse than what it was. Yes, they were frustrated with the losses they incurred. Yes, they preferred Debbie didn't come at all. And yes, they will need to repair some IOM damage (drainage, orchard floor and/or canopy). But the vast majority were happy with the IOM works they had completed to date, and the associated results.

Growers have told me that they could only imagine how much worse it would have been if they hadn't invested in IOM.

"If we didn't put those drains in and if we still had bare soil across the orchard the losses would have been far worse," is the common refrain.

I hope that your IOM investments delivered a positive return during Debbie (possibly of minimising losses).

Upcoming events

I am currently coordinating the annual consultants' forum, held in early June in Brisbane. This is an important industry event where the R&D program provides a detailed update to advisors, i.e. processor and rural retailer reps and private consultants. This enables the people growers get advice from to be up to date on the latest R&D outcomes, meaning that growers can access a detailed update from their trusted advisors. It also means that the advisors can provide practical orchard-related input into the R&D program through direct discussions with researchers, the AMS and HIA.

The annual consultants' forum is important to ensure we develop key consistent messages for the industry on specific issues. It has been achieved in the past on issues such as IOM and ION. A consistent message helps to build grower confidence in investing, and this meeting is often a key starting point for these developments.

After the forum, we will be coordinating the July round of MacGroups across all growing regions. We are contemplating trying a new structure for these meetings, based on feedback and the success of the December round of MacGroups that had capped numbers in the Northern Rivers. Growers said that smaller groups encouraged more discussions, enabled a greater understanding of a single issue and ultimately added more value. We want to replicate that success in July, and ensure growers continue to get value with the aim of increasing profitability and production. That is what it is all about. From that strong foundation, the industry can continue to build and expand.

Keep an eye out for more information on the upcoming MacGroups in July. They provide grower focused R&D updates to help you increase production and improve profitability, have great food for you to enjoy and are a great chance to talk directly to other growers in the industry on a common issue. There is no cost to attend.



More than 150 people attended the March 2017 Bundaberg MacGroup, the proceedings of which were broadcast online through an arrangement with Queensland Country Life.

Good luck for 2017 harvest

All the best for the harvest season, and I look forward to seeing you all at a MacGroup meeting in July!

Robbie's recent Mac Movements

1. Coordinated regional ION workshops for consultants and advisors (six meetings, two in the Northern Rivers and one in each of the other major growing regions)
2. Completed an HIA milestone report for the MC15004 project
3. Organised the 2017 annual consultants' meeting in June
4. Presented to API Rural Queensland Property Conference on behalf of the macadamia industry
5. Met with the harvest review researchers and provided introductions to a range of growers, processors and stakeholders
6. Worked with HIA and the Strategic Industry Advisory Panel (SIAP) in reviewing options to gain increased industry and grower involvement in the industry's R&D program through Industry Reference Groups (IRGs)
7. Completed the March round of MacGroups, attended by more than 400 people
8. Helped coordinate the Bundaberg macadamia growers celebratory dinner
9. Worked with *Queensland Country Life* as a partner for the Bundaberg MacGroup meeting in March.
10. Celebrated our first Easter as a family of four – with a lovely daycare obtained flu!

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 Project MC15004

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NORTHERN ORCHARD HIGHLIGHTS

Brice Kaddatz, Industry Productivity Support (Queensland)

Earlier this year, Brice Kaddatz travelled north to visit macadamia growers from Yeppoon to the Atherton Tablelands. His report reveals much activity on the part of a growing band of orchard owners who are trialling different cultural methods to identify those most suited to their situations, and are working to ensure their trees are managed to ensure sustainable production. Some orchards are also still recovering from the effects of Cyclone Marcia in 2015, which makes the progress these orchardists are making even more impressive.

Orchard snapshot

A visit to a number of farms in Mackay highlighted the variety of enterprises that growers are involved in as well as macadamias, particularly sugar cane and cattle. This situation is different to that in the Northern Rivers and southern parts of Queensland, where the majority of growers focus on macadamias.

An example is Bill Toon, who has a small orchard on the banks of the Pioneer River. While Bill is heavily involved in cane farming and a substantial beef cattle operation, he also manages to keep his 500 trees in good shape, harvesting several tonnes of NIS in most seasons.

At Yeppoon, some orchards are still showing the effects of the battering from Cyclone Marcia in February 2015. A bright spot was Maureen Murray's

orchard at Tanby. After the cyclone, Maureen and her band of helpers worked hard to clean up the debris and get the remnants of the orchard back into working order. The fruits of that labour are in evidence, and it was inspiring to see a strong flowering coming from trees which are already hiding much of the damage originally rendered.

We don't hear much about orchards around Sarina, which made a visit to Graham Matsen's farm at Mt Christian a great pleasure. Graham is a cane farmer who planted 5,000 macadamias about seven years ago and his attention to detail and applied farming skills see the orchard in good shape.

He delayed his early crop yields by maintain a small canopy while the trunk thickened and the



Reinvigorated trees, which were previously in serious decline, on the Inderbitzen orchard on the Atherton Tablelands.



Greg O'Neill shows a typical branch removed from a 741 variety tree.



Cincturing for four seasons has resulted in helping to improve yields on the O'Neill orchard.

indications are that this is paying off. Cyclone Marcia did not worry the trees as it skirted the coast and the 2015 crop was encouraging. The 2016 crop was disappointing by comparison, however, the flowering and early nut set looked promising for 2017. Unfortunately, in March 2017 Cyclone Debbie destroyed about 500 trees in Graham's orchard.

The Atherton Tablelands is the location of our most northerly orchards. I visited two of these, one owned by Kureen Farming (Inderbitzen family) and the other by Greg and Wendy O'Neill.

The Inderbitzen family orchard survived the double whammy of two massive cyclones in 2006 and 2011, when tree numbers were reduced from 12,000 to less than 8,000. The effect of those weather events plus a major issue with AVG has made life difficult and sustainability precarious. With many trees struggling with dieback, the difficult decision was made to prune them exceptionally hard. Fortunately, the trees are now substantially recovered and producing. The remaining trees suffering from AVG will be removed and replaced with resistant cultivar A268.

The good news is that despite the AVG and dieback issues, production has averaged better than 100 t across the past few seasons.

Greg and Wendy O'Neill lost 4,000 mature trees in the 2006 cyclone. This, combined with AVG, resulted in production falling from 70 t NIS to less than 10 t. The O'Neills have since worked liked demons to relieve the symptoms of AVG in the remaining 2,500 trees, which were only 3 or 4 years old when the 2006

cyclone took out the mature orchard. These trees were of course battered again in 2011.

Greg has monitored the cultivars in his orchard and proven conclusively that A268 have the strongest resistance to AVG, while varieties 741, 849 and A16 have all been more susceptible. He instituted

a process of removing one significant "tall" limb from each AVG affected tree each season and over several seasons it was noticeable that the canopies of trees receiving this attention were falling open and production was being maintained.

He has since used cincturing for four consecutive years with success. The average yield across his now (largely) mature AVG affected trees is consistently

around 19 kg NIS per tree. Inspection clearly shows where a limb has been positioned inadvertently below the cincture production is zero, while immediately above, a strong nut set exists.

Greg has also trialled a snake-like cincture where the circle is not complete and the ends pass each other with an unbroken bark layer between. This has proven to be equally successful.

He has recently been approached by two large Atherton farmers for information on growing macadamias in the area. Interest is to the western side of the tablelands where the weather conditions are more stable and where water supplies are reliable.

GREG HAS MONITORED THE CULTIVARS IN HIS ORCHARD AND PROVEN CONCLUSIVELY THAT A268 HAVE THE STRONGEST RESISTANCE TO AVG

This project has been funded by Horticulture Innovation Australia Limited using the research and development macadamia industry levy and funds from the Australian Government.



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RIVERBEND HARVESTS 2-YEAR-OLD CROP

Robbie Commens, Macadamia Industry Productivity Development Manager

Orchard:	Riverbend, south-west Bundaberg
Owners:	Gerda and George Hobi
Property size:	100 ha - 32 ha to macadamias (10,000 trees) and 68 ha to grazing
Trees:	741 (50%) and A203 (50%), 2 ½ years old (planted October 2014)
Spacing:	8 x 4 m
Soils and topography:	Duplex soils with sandy loam over clay, gently undulating
Irrigation:	Trickle tape about to be replaced with sprinklers



George and Gerda Hobi manage their orchard Riverbend with assistance from their children Melanie and Ronny during school and university holidays. The Hobi family are not newcomers to agriculture, having had over 20 years of involvement in the dairy industry both in New Zealand and in Australia. They happily confess that they are now macadamia growers “by chance”.

George and Gerda are originally from Switzerland. Their move to the southern hemisphere happened after their honeymoon in New Zealand in the early 1990s when they took up an opportunity to manage

a dairy farm and moved to the South Island. About 10 years later, after both managing and owning dairy farms in New Zealand, they decided to sell up and move to country Victoria, where they bought another dairy farm.

After 20 years owning dairy farms in New Zealand and Victoria, George and Gerda were keen to move to a warmer and drier climate further north. They stress that they were keen for a new challenge but still wanted to live in rural Australia. After selling their dairy farm in Victoria, they bought Riverbend, their 100 ha property, which is in south-west Bundaberg and has frontage to the Burnett River.

Extensive research points to macadamias

It was the beef industry rather than macadamias that was originally on the Hobi family’s radar, but George’s extensive research turned up other options that would be profitable in the long term. A close neighbour who has macadamias on their property, which are growing and now producing well, suggested looking at macadamias. As a result, George and Gerda started a serious investigation into macadamia production and engaged the services of many local growers and other experienced people in the industry to provide specific advice on turning their property from grazing to a commercial macadamia orchard.

The property had previously been used for grazing, meaning that it could be readily transitioned into another crop with minimal issues. A big plus was that there was an area of 32 ha that was gently undulating and on a higher section of the property, where the risk of frost was lower. This was deemed suitable for macadamias. Another plus was their location on the Burnett River, which meant that they had access to irrigation water, a necessity for macadamia production in this region. As well, the irrigation mains were already in place across the 32 ha, where pasture has previously been irrigated. This represented a major capital saving for the Hobi family.

Before the Hobis bought Riverbend, other people had looked into investing in macadamias on the property, but they were concerned about frost. After extensive discussions with growers and advisors, George felt this was a manageable risk. He reasoned that the major risk period is while the trees are young, so once they were established (>5 years old) the potential for a frost

to kill entire trees would be dramatically reduced. And while there is a risk of frost at flowering causing flower death in established trees, again George was convinced that this was manageable.

The stars were lining up for the Hobi family to become macadamia producers. What tipped them over the line was an opportunity too good to pass up. In 2014 there was a 12- to 24-month lag time to secure trees, however, after a substantial order was cancelled, George and Gerda had an opportunity to take delivery within six months. They jumped on the chance and bought about 10,000 trees - 5,000 741s and 5,000 A203s.

Advice obtained for the Bundaberg region supported these as suitable varieties. This is backed up by industry nursery surveys, which indicate that these are the two most popular varieties being ordered in the Bundaberg region.

Orchard preparation and planting

With trees secured and the commitment to become macadamia growers made, it was time to prepare the ground for planting. In early 2014 George had the area surveyed to identify the most suitable drainage system

to install. Extensive ground preparation then started, with the entire area disced and cross ripped. A grader was used to create the drainage channels throughout the orchard and construct 600 mm mounds 8 m apart, based on their decision to use 8 x 4 m spacings. After a whirlwind of earthworks the ground was soon ready for planting.

The trees arrived in October 2014 and the entire orchard was mechanically planted in five days, a rate of 2,000 trees a day. Immediately after planting George and Gerda laid the trickle tape out and placed tree guards on every tree, and laid a biodegradable weed mat at the base of each tree. The corflute tree guards were triangular and had a plastic coated, 1.2 m aluminium stake placed in each corner between 300 and 500 mm deep in the soil.

George felt that the tree guards were very valuable and played a positive role in minimising frost risk, protecting young trees from herbicide damage and helping to stabilise the trees. They also helped to protect the young trees from rabbit and wallaby damage.

After two years, the guards were removed as George noticed that the trees were filling the guard. As a

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result, the guards could have restricted growth in the future. The high level of organic matter in the tree row (caused by side-discharge mowers placing clippings cut from the interrow along the tree row) was creating a dam effect around the base of the guard. In heavy rain, this meant that water was trapped in the bottom of the guard, dramatically increasing the risk of Phytophthora.

As George said, "The tree guards were a must-have for us. They did a great job for what we wanted but now that job is finished and it is time to remove them."

George and Gerda considered cross pollination when designing the orchard. They decided to use a two-row by two-row planting layout, i.e. two rows of A203s alternated with two rows of 741s, meaning that every tree has direct contact on one side with another variety. George stated that while all agriculture is evolving and you can never get it perfect, he felt that this layout enabled them to "hedge their bets" on cross pollination (as it is an unknown and unproven requirement for macadamia production) while also allowing for efficient orchard operation. Entire rows of a common variety means that inputs can be applied "by variety" if needed, and it provides long runs of a common variety for harvesting in the future.

Production after 2½ years in the ground

Amazingly, about two and a half years after planting, the A203s were producing a crop and were hand harvested in April this year. George, Gerda, their son Ronny and eight backpackers hand stripped the 5,000 trees over a six-day period. After all the nuts were harvested, sorted and dried the average yield was 1.5 kg of NIS per tree, with an average SKR of 31%. An incredible result.

Obviously the A203 genetics play a part in this early yield as the 741s did not produce a notable crop, but management is the other crucial aspect involved.



Riverbend orchard 1.5 years old with tree guards

What do George and Gerda put this great result down to? They say it is a combination of things including:

Timeliness. After his involvement in the dairy industry, George said he saw firsthand the importance of timeliness in agriculture. This means that when a job needs to be done, it gets done, regardless of whether it is a public holiday, a Sunday night or a Wednesday afternoon.

The tree guards. George felt that the tree guards provided crucial support and protection for the trees when they were young, i.e. they provided physical support when it was windy and protected the trees from herbicides and wildlife nibbling on the young trunks.

He also used a biodegradable weed mat at the base of each tree in line with the tree guards, and said that the two needed to be used together to get the best results.

Strategic pruning. George and Gerda plan to undertake limb removal in their young trees. The aims of pruning are to minimise the risk of damage from wind and to open up the tree for light. They do not prune for a central leader, rather they prune to level out the tree (as the constant Bundaberg wind creates a "lop sided" canopy, with more canopy growth on the down side of the wind) and enable wind to pass through it.

A proactive, well planned nutrition program.

George works with agronomists to develop a suitable nutrition program and makes sure that it is implemented in a timely manner. He uses a combination of fertigation and foliar fertiliser, and said that after the sprinklers are installed he will also incorporate granular slow release fertilisers. He believes that with the trickle tape, granular fertiliser had limited benefit.

George also used some frost protection products to help minimise the risk of frost damage.



George Hobi in the orchard

Assistance from the industry. George and Gerda have been very pleased with the openness of the macadamia industry, stating that it reminds them of the dairy industry where everyone shares ideas and experiences, both good and bad, with each other.

What of the future of the Australian macadamia industry?

I asked George and Gerda what they felt about the future of the macadamia industry. George summed up their perspective as follows:

"I think macadamias are the healthiest nut you can buy, and this is a huge competitive advantage for the industry in the future with the current consumer focus on health. Even though there is a significant amount of hectares about to be planted in Australia, and across the world, it will take five years or more until those new plantings come into full production. This gives us time to ensure demand continues to exceed supply and help to maintain a strong price."

"The industry's marketing program focus on health and beauty is the right direction."

Macadamias in Switzerland

As he comes from Switzerland and still has family there, I asked George how they felt about macadamias. He explained how he tested this.

"There are still a lot of people who do not know about macadamias, which is a sign of how young the industry is. This represents a big opportunity. I went back to Switzerland to visit family in July 2016 and took thirteen kilograms of factory fresh nuts with me to show my family and friends macadamias first hand. Many of them had not heard about macadamias, let alone tasted one. When they did, they really enjoyed them."

"I purposely went looking for retail macadamias in Switzerland while I was there, after seeing how little my own family knew about them. I found them in some supermarkets but the quality was very poor. They tasted terrible compared to the factory fresh ones I took over."

"This presents another opportunity for the future, not only introducing those who do not know about macadamias to them, but also reintroducing consumers to high quality macadamias. And I think Australian macadamias are best placed to do that – deliver high quality macadamias to consumers across the world."

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CAREFUL MANAGEMENT PROMOTES EXCELLENCE ON NON-TRADITIONAL ORCHARD SITE

Jim Patch and Kevin Quinlan, MPC

Orchard:	Balmoral Plantations, Caniaba, Northern Rivers
Owners:	Stewart and Salina Edmonds
Orchard size:	64 ha planted to 20,000 trees – 14,000 trees are 29 years old and 6,000 trees are 20 years old
Varieties:	Mixture of varieties, most are 344. Other varieties are 246, 741, 842, 849, A4, A16 and 333
Spacing:	8 x 4 m
Soils and topography:	Heavy black cracking clay (Vertosol), undulating
Irrigation:	Sprinkler system



Stewart and Salina Edmonds' orchard at Caniaba west of Lismore is atypical of many in the Northern Rivers in that it isn't on the area's Ferrosols and annual rainfall is relatively low. This has meant adapting management strategies tailored to their situation to optimise production.

The Edmonds family, which has a long history of farming in the Lismore area, bought their Caniaba macadamia orchard in 2003, and in 2012 Stewart and Salina bought it from the family company. The orchard isn't a typical one for the Northern Rivers in that it is not on the Ferrosols favoured by most macadamia growers in the area and its average annual rainfall of 1180 mm is relatively low. Its heavy black cracking clay soils present particular management challenges for horticultural enterprises like macadamias; they get very slippery and boggy when wet and, when dry, form cracks that are big enough to lose a boot in.

When the Edmonds family bought the orchard, it was planted to 20,000 trees, 14,000 of them 15 years old and 6,000, six years old. Unfortunately, it had been poorly managed and the trees were in a poor state. This meant that the immediate challenge was rejuvenation using integrated orchard management principles, i.e. drainage, orchard floor and canopy management as well as attending to nutrition and soil health.

Stewart Edmonds said that their underlying management approach is to plan, get professional advice and maintain meticulous records as these are a valuable source of data that are used to refine and guide future management decisions.

Soil health first priority

Improving soil health was the first priority. A nutrition management plan was developed that was tailored to the orchard's cracking clay soils, which have different properties to Ferrosols and duplex and alluvial soils.

A key aspect of this was adding organic material as a way of improving soil structure and water holding capacity. Just after the Edmonds family bought the orchard they applied a large amount of organic material, and in 2005 they moved from conventional tractor-mounted mowers that left the cut grass in the interrow to side-throw Toro mowers. This cut grass provided organic matter, which was placed under the tree to cover tree roots. Stewart explained that it also had other benefits.

"In the early years, the mown grass that we left in the interrow covered the living grass, slowing regrowth and, at times, killing it out altogether.

“It also meant when we came to harvest that the orchard row was drier than before,” he said.

After switching to the side-throw mower, the grass in the interrow became a well-managed “carpet” that allowed for easier and faster harvesting management and improved harvest efficiency as few nuts were left behind after a pass with the harvester.

In keeping with their approach of bringing in specialist advice when needed, a plant nutrition program is overseen by an agronomist. A custom-blend fertiliser is applied in 10 or 11 small treatments over the year. The aim of having this number of applications is to ensure as much fertiliser as possible is available to the tree and not lost in heavy rainfall or really dry periods.

Stewart also believes that Seasol helps relieve plant stress and might help reduce premature nut drop so it is applied at 5 L/ha each time the orchard is sprayed for insect management.

Irrigation boosts production

After a few years, Stewart and Salina decided that the lower rainfall in their area was hampering production, and that installing supplementary irrigation would be a way of ensuring more regular, higher yields. They had two dams that hold a total of 46 ML built for a water source. This was enough to irrigate 22 ha or 7,000 trees. NSW State regulations prevented bigger storages being built.

Sprinklers that water at a rate of 75 L/hour were installed over the 22 ha.

“The system works very well and the irrigated section of the orchard is more consistent in production and yields more than the unirrigated section,” he said.

Profiling covers tree roots

The Edmonds bought a small road grader and have used it to profile the orchard, pushing soil from the centre of the interrow up to the tree line and covering exposed roots. Profiling has also increased the fine feeder root mass and helped control water flow that could lead to erosion.

When it rains, water is directed down the grassed interrow and passes out of the orchard without causing erosion trenches along the edges of the tree canopies. A continual program has been implemented to retain ground cover and keep the orchard floor level to ensure an efficient nut harvest.

A Digga Harley rake mounted on the front of a skid-steer loader is run up and down the rows and levels the orchard floor with minimal disturbance to ground cover, providing a smooth harvesting surface. Lose material is swept back into the tree row using a Digga road broom, also mounted on the front of the skid steer loader.

Hedging to manage canopy

A hedging program has been developed to encourage the growth of new fruiting wood and to allow light to reach the orchard floor to maintain ground cover. Under the program, implemented over a four-year rotational cycle, the orchard has been divided into four sections with one section hedged each year.

“In our conditions, which are different to farms closer to the coast, hedging and the fact that we cut wood off well back into the tree has meant that we don’t suffer the ‘wall of death’ that others have experienced,” explained Stewart.



(left) Close up of the Harley rake and the skid-steer loader with the rake fitted to it.

He believes that this four-year rotation, along with his other orchard management practices, allows him to maintain trees that are compact.

"We no longer have dead sticks falling out of our trees from dead centres so there is not a problem with the harvester picking up sticks and pieces of wood to block the dehuskers," he said.

The harvesting challenge and the importance of weather forecasts

Harvesting 20,000 trees on an undulating site can be a challenge, particularly when it is wet. According to Stewart, their orchard floor management program helps relieve some of the issues that can emerge. They only use side-throw mowers and they place the cut grass under the trees. Coming into harvest, they mow regularly to ensure that grass under the trees is finely cut.

"When the pieces are small they rot away quickly and mat down, so mostly don't get swept out again. From the first round of harvest, I have a mower following the harvester," Stewart said.

Importantly, he plans for the harvest season and adapts quickly to the prevailing conditions.

"I follow the weather forecasts and if rain is forecast, we will harvest twenty-four hours a day to pick up as much crop as possible. We don't want to lose crop or kernel quality," he said.

The bottom line

The integrated management approach taken by Stewart and Salina and their attention to detail in the orchard have certainly paid dividends and resulted in a highly productive orchard in an area and on soils where macadamias are not traditionally grown.

As proof of the success of their approach, the Edmonds have won a number of quality awards from their processor, MPC, and last year they achieved production of over 5.5 t/ha. They were also recognised in the AMS State of Origin awards, receiving the award for Most Improved Orchard Production for 2016 and a State of Origin Representatives Award for Large Orchards.

The orchard's very low level of production when the Edmonds bought it in 2003 has been substantially increased and it has been developed into a very tidy, easy to manage, high producing example of what can be achieved through integrated management, a lot of hard work and a commitment to excellence.

Acknowledgment. This is an edited version of an article by Jim Patch and Kevin Quinlan that was published in the December 2016 edition of MPC's newsletter *The Nutshell*.

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BUNDABERG DINNER CELEBRATES TOP PRODUCTION

The AMS recently hosted a dinner for Bundaberg growers in conjunction with the *Queensland Country Life* (QCL) 'Food Heroes' initiative rolling out throughout Queensland and telling the food story of paddock to plate.

The dinner celebrated Bundaberg becoming the largest macadamia producing region in Australia - and the world - and featured presentations by Andrew Pearce and Ian McConachie as well as a panel discussion.

The dinner followed the AMS Bundaberg MacGroup, which was staged at Queensland Department of Agriculture and Fisheries research station and featured an update and farm walk on the Small Tree – High Productivity research project delivered by Dr John Wilkie. The MacGroup was live streamed by QCL (and watched by more than 1000 people!).

Note. The grower dinner was funded mainly using funds sourced from the AMS with with a modest contribution from QCL.



Andrew and Janelle Gerry



Lynne Ziehlke (right), AMS, speaking at the panel session



Max and Yolanda Millar



Michelle Herbert (left) from Stahmann Farms and Corinne Jasper, HIA



Lorin Young (left) from Alloway Macadamias and Chris Searle from Suncoast Gold Macadamias



(l to r) Federal Minister for Hinkler and Assistant Minister for Trade, Tourism and Investment the Hon. Keith Pitt with Phil Zadro and Jolyon Burnett (AMS)



(l to r) Growers, Geoff Chivers, Andrew Pearce and David Harris.

NO REST FOR MACCA GIANT

Lucy Kinbacher

Macadamia grower Phil Zadro stopped counting his macadamia trees many years ago but he knows he has eclipsed the one million mark.



World's biggest macadamia grower Phil Zadro was at the Food Heroes Bundaberg dinner celebrating the macadamia industry to which he has made a huge contribution. Photo: Lucy Kinbacher

The 84-year-old has properties in Bundaberg, Childers, Northern NSW, Mt Bauple, South Africa and most recently Emerald and produces 7,500 t of macadamias annually with large areas of new plantings set to gradually begin producing too.

As the world's largest macadamia grower, Mr Zadro has no plans to slow down and is constantly looking at new ways to improve his planting techniques and locations to expand.

Challenge could very well be Mr Zadro's favourite word and was the reason he decided to buy a 4,500 ha cotton farm in Emerald and transform it into his next 'macadamia land'. Work is currently underway planting the first 600 ha of trees on the property and Mr Zadro said it would be two to three years before he would know if the area was suitable for macadamia production.

He had strongly considered choosing a location in Mozambique or Swaziland but said he couldn't go past the strength of the Australian industry.

"We are 95 per cent certain that Emerald will be a good area to grow macadamias but we need to fine tune some of those challenge that we have in there - predominately environmental challenges," he said.

"Heat and water stress, basically they are the challenges.

"The land is very suitable to macadamias; Emerald has some of the best soil in Australia to grow anything provided you have water."

As speakers at the Food Heroes dinner in Bundaberg pointed out, Mr Zadro doubted the potential of Bundaberg for growing macadamias when growers first launched the industry in the 1960s. But he soon caught on to their bright idea and was one of the first corporate investors to shift his large-scale commercial macadamia farms north to Bundaberg.

Now with trees in varying locations and weather conditions across Australia, there are different practices across each of Mr Zadro's properties to suit the climate. One thing remains the same, however – innovation and using the latest practices are a must.

He is the first to admit that even after about 50 decades in the industry it's only now that he is beginning to realise how much they have to learn about macadamias.

"Technology comes easy to us, it's mainly how to grow macadamias that is the most difficult part and this is what we are wrestling with," he said.

"It's only been around for possibly forty or fifty years as opposed to other products such as grapes or wheat or corn so there is a lot of information around for them but with macadamia, we are still writing the book."

Four or five years ago average yields across Mr Zadro's properties were 3 to 3.5 t/ha. Now the average is up to about 4.5 t/ha, and he is aiming to expand yields even further to 5 to 5.5 t/ha.

"Globally Australian product is viewed with a lot of respect and Australia is very well poised to expand the industry," he said

Acknowledgment. Thanks to *Queensland Country Life* for allowing reproduction of this article.



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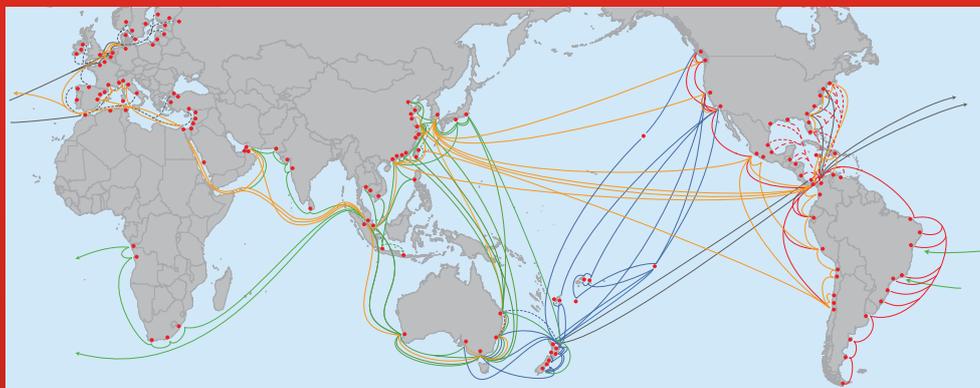
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DROUGHT, FLOOD, GUIDES AND MUD

Jeremy Bright, Macadamia Development Officer, NSW DPI

Despite a very dry spring in most of the NSW macadamia growing region and then a visit from ex-tropical cyclone Debbie, most reports are that actual harvest loss is around 5% as full-on harvest had not yet occurred. A bigger issue has been loss of soil and access roads on many farms.

Over the last few years since the Integrated Orchard Management (IOM) series has been published, we have seen extensive works being carried out on established orchards. This has involved significant tree and row removal and general earthworks to create grassed water courses and inter-rows. Obviously for these to be effective we need the moisture to follow the seeding out of our living ground covers. The IOM guide suggests planting out at a rate 10 times greater than when seeding pasture, but this is of no help if rain stays away, as it did late last year and into the new year.

Then came the rain with Cyclone Debbie. Despite the destruction she caused, there have also been good news stories about newly established living ground covers being able to withstand what Debbie threw at them. Fortunately, from the damage reports collated and forwarded to the powers-that-be, there has been some relief in the form of grant money to Lismore and Tweed Local Government Areas (LGA). This will go some way to fixing the eroded tracks etc.

Publications in the pipeline

The *Integrated Orchard Management Drainage 2017* book is on track to be released to industry around June this year. The book will detail the process involved in setting up your farm to take on water flow, move it safely through the orchard via designated stable watercourses and discharge the clean water from your orchard. The book is very much a companion to the previously released *Integrated Orchard Management Practice Guide* and IOM case study booklet. When industry was asked to review these guides, a lot of people indicated that they understood canopy and orchard floor management but were unsure where to start as far as drainage management was concerned. It is hoped that this book will help provide an understanding of drainage management. It brings together:

- three steps that can solve most erosion problems in macadamia
- drainage extras to troubleshoot problem areas
- how LiDAR mapping can help refine drainage within an IOM framework.



Grassed watercourse doing what a grassed watercourse does best. Photo: J. Bright.

Another publication being released by NSW DPI in July this year is the NSW *Macadamia Plant Protection Guide 2017-18*. This year's feature article will be a review of diseases of macadamia written by pathologist Dr Olufemi Akinsanmi (Femi). It will also review any new chemistry that may be registered since last year or that has come under a permit. Every year grower feedback about the guide has been extremely positive so I am determined to keep the publication coming out in hard copy to industry. This year we have attracted a few more sponsors, which is fantastic as it is closer to becoming a cost-neutral publication. Thanks to Stahmann Farms and Suncoast Gold for advertising in it.

Floodplain industry expands

Reports of an ever-expanding floodplain industry in Northern NSW are creating a lot of excitement. Having seen this section of our industry go through ex-cyclone Debbie relatively unscathed has certainly given me confidence that we will see very dynamic growth in the industry as a result of the large-scale floodplain plantings occurring.

Benchmarking

We can never have too many growers involved in this project. If you are new to the industry or been in the industry for a few years and are not involved in the benchmarking project, you should consider it. The industry is underrepresented in the northern NSW region.

Please give me a call and I can explain the project to you and detail how you will receive a confidential report comparing your yield and quality to that of other farms of similar size, tree age and region. It only takes five minutes to fill out the form and then you will be well informed on your progress within this industry.

And finally, I hope everyone has a very successful harvest for 2017.

Information

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IN THE NEWS

As part of the levy-funded communications program we strive to get positive mentions about macadamias in the media as often as possible both nationally and regionally. The following pages show some of the highlights from January to March 2017.

It's bonanza time for macadamias as overseas demand goes nuts

SUE NEALES
RURAL REPORTER

Australia's only major native crop, the macadamia nut, has hit the big time as rocketing demand from China, Japan and Korea fuels industry expansion, investor excitement and soaring grower profits.

With a bumper harvest now delivering a record 54,000 tonnes of macadamia nuts in the key growing region from Ballina in northern NSW to Bundaberg in Queensland, the once-boutique industry has swelled from producing less than \$100 million of nuts in 2012 to \$280m this year.

Macadamia prices of up to \$550 per kilo of raw nuts — double the prices paid to farmers three years ago — are seeing new investors, including Chinese players, snap up established orchards for as much as \$70,000 a hectare.

Many of the original Byron Bay hobby farmers with just a few hectares of rolling macadamia hill orchards, who once characterised the fledgling industry, have sold up as a new breed of nut growers and foreign companies buy up plantations and focus on bottom-line profits and improved yields.

Seasoned farmers — including the world's macadamia king Phil

Zadro — are just as busy planting new trees on cheaper coastal sugarcane country or pioneering growing options around Emerald.

Ken Dorey and his five brothers, who went from being the biggest cane growers in NSW to one of the macadamia industry's key farming families in two decades, recently sold 200ha of high-value macadamia trees at Knockrow, north of Ballina, to the Chinese-linked CLHA macadamia joint venture group, trading as CL Macs.

The \$10m-plus sale saw the Gympie-based CLHA expand its macadamia orchards to more than 800ha spread from Bundaberg to Ballina — in addition to owning a nut-drying plant at Gympie.

Mr Dorey said the sale of half its existing orchards had allowed his family to pay off debt, reap some profits after nearly 20 years of being macadamia pioneers, and fund the planting of more than 15,000 new trees in 80ha of former family canefields lying idle.

It has also fuelled the family's determination to remain major macadamia growers, with better tree genetics and innovations such as the reduced use of chemicals, biological pest control and soil composting boosting average nut yields from 2.2 tonnes/ hectare five years ago to above six tonnes now.



National highlight

During March a two-day media tour was held for journalists from publications and journalists including *The Australian*, *Nourish*, *Country Style*, *Australian Women's Weekly*, AAP and freelancer Carla Grossetti. The objective was to promote the versatility of macadamias, including their health and beauty potential, and to provide an insight into the growing, harvesting and processing of macadamias.

The Australian | 22 March 2017 | Circulation 94,419

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Business to business strategy

BY LUCY KINBACHER

THEY have already won over consumers and now the Australian Macadamia Society (AMS) plan on ensuring demand stays ahead of supply by focusing on a business to business marketing strategy.

With a growing focus on consumer development the traditional target for most industries, macadamias are taking a different approach.

The five-year strategy will focus on three key areas: developing relations with marketers and R&D officers of food manufacturers, challenging universities and researchers to be creative in their use of macadamias and developing the macadamia image through promotional work.

AMS are also hoping to launch 10 new macadamia products by 2018 to show food makers that their product is more than just a snack.

Speaking at the Food Heroes Bundaberg event,

AMS market development manager Lynne Ziehlke said

macadamias were relatively underutilised in food manufacturing due to a traditional

lack of supply.

"We know consumers want the product but driving it from that end isn't enough, we need to drive it from the

other end as well," she said.

"This growth in supply presents a real opportunity for us because it will give manufacturers and our

buyers far more confidence in our product and that has been one of the key barriers to using macadamias more frequently.

"They are not likely to launch a product if they don't know that they are going to have the macadamias to put in the product. It's a really significant change in the next few years."

She said large food manufacturers could have thousands of raw materials under their banner but only focused their attention and energy on the top 20 per cent of ingredients.

With macadamias only

making up a small percentage, Ms Ziehlke said it was important to develop businesses knowledge of the product.

"We know there is a base level of understanding but they don't go to the next step to understand the next level," she said.

"We will continue to do work in the consumer space but pragmatically also work across other markets.

"There aren't a lot of macadamias to go around and we need to be clever about what we do."

Regional highlight

MacGroups were held in February and March with a focus on launching a new marketing strategy designed at an increasing demand for the macadamias by targeting food manufacturers and processors.



Australian Macadamia Society's market development manager Lynne Ziehlke speaks about their new business to business strategy at Food Heroes in Bundaberg. Photo: Bob Dutton/ABC

Queensland Country Life | 23 March 2017
Audience 24,035

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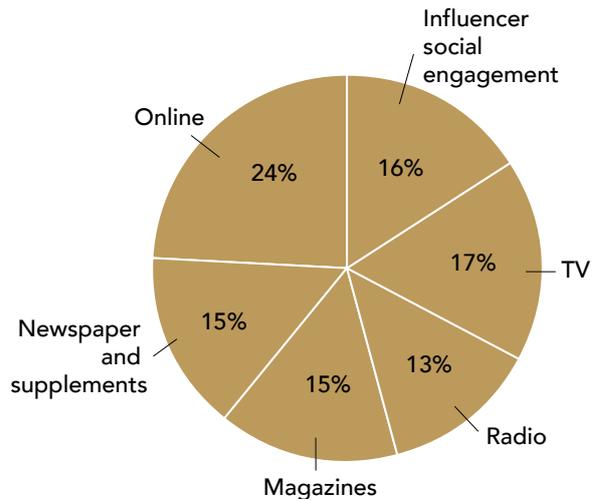
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Media results - 2016-2017

The table and chart detail how many positive stories about macadamias have appeared in different media as a result of the levy-funded marketing program and communications program, as well as how results are tracking compared to our marketing strategy targets.

KPI analysis	Current	End-of-campaign target
Positive stories	286	455
Feature stories	3	5
Message rating	3.4	3 out of 5
Known circulation	34 million	
Known audience	63 million	40 million
Editorial type	79% editorial / 21% recipes	70/30
Outlet type	56% Metro / 44% Regional	70/30



Media outlet overview 2016 - 2017



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Social media



Celebrity chef Lyndey Milan reached an audience of 218,000 on Ch 7's The Morning Show with an upside down salted caramel cheesecake with macadamia pretzel praline.

twitter

Reach
 January: 104,080
 February: 167,766
 March: 319,606

facebook

Reach
 January: 76,932
 February: 75,460
 March: 73,693



Our grower profiles continue to be popular on Facebook and the website with these ones on Greg James and Graeme Wessling boasting high engagement rates of 6% and 8% respectively.

Thank you

Thank you to all the growers and other industry members who contributed to the industry marketing and AMS communications program over the last three months by participating in media interviews and press, television and social media features and the development of our photography and video library including: Schon Condon, Glen Otto, Flora Zhang, Tina Tian, Rex Harris, Jeremy Bright, Brett Newell, Neil Innes, Steve Dubber, Melissa White, Henri Bader, Tony Flick, Peter Fraser, Bob and Judy Howard, Mason Roy, Loren Pouette, Phil Zadro, Dr John Willkie, Shane Johnson, Ken Dorey, James Thomas, Greg O'Neill, and Eddie, Martin and Pam Brook.

This project has been funded by Horticulture Innovation Australia Limited using the research and development macadamia industry levy and funds from the Australian Government.



R&D SNAPSHOT OF LEVY-FUNDED PROJECTS

This snapshot provided by HIA is an overview of where a sample of the projects funded through the macadamia industry levy are up to. For a complete list of R&D projects funded through HIA, go to page 48.

Disease management in macadamia industry (MCI2007)

What's it all about? This project, began in 2012, brings together an expert research team whose aim is to deliver improved, sustainable and efficient disease management strategies for the macadamia industry. The team is working on a range of strategies, from integrated disease management systems for husk spot, to the use of disease-resistant varieties, to investigation of emerging diseases of concern.

What's the latest? Disease management programs for husk spot and Phytophthora root rot were a key focus and success story for the project in 2016, with the industry reporting increased adoption of integrated management approaches for Phytophthora diseases in particular, including improved soil health management practices. This was the focus of the July 2016 round of industry MacGroups, and a macSmart video on integrated management of Phytophthora available on the macSmart website.



(l to r) Leaves on trees showing nutrient deficiency at three years after application of organic amendments (compost, sugar factory waste mill-mud) and back spray with phosphorous acid (chemical) compared with untreated soils and their corresponding percent soil organic matter contents.

Recent work towards other project goals has included:

- **Husk spot fungicide efficacy trials.** With data from three seasons now analysed, initial results suggest fungicides in the SDHI (succinate dehydrogenase inhibitor) group may serve as alternatives for husk spot control. Information was provided to DuPont Crop Protection Australia, with residue information and further data to be produced to support application for the registration of a new product with the Australian Pesticides and Veterinary Medicines Authority.
- **Phytophthora and soil health research,** with two large-scale commercial field trials assessing the impact of different soil organic amendments on root rot and tree decline. Researchers report that amendment treatments greatly reduced tree decline and increased average canopy density. Results provide strong evidence to support reduced reliance on pesticides for Phytophthora control, and a greater focus on key indicators for assessing soil health in orchards.
- **Phytophthora susceptibility trials for macadamia varieties,** revealing that different species and hybrids of macadamia vary widely in their susceptibility to Phytophthora root rot. *Macadamia tetraphylla* appeared to be more tolerant than *M. integrifolia*, while *M. ternifolia* was observed to be the most susceptible to root rot infection.
- **Husk rot trials,** which have been looking at the role of various treatments on disease incidence. Initial results suggest the chemical composition of the macadamia husk may play a role in husk rot incidence.

Throughout the project there has also been ongoing laboratory work, analysing disease samples from growers and consultants to identify pathogens responsible for various diseases in macadamia. Diagnostics feedback has been regularly provided to growers.

Biology, species and genetic diversity of macadamia lace bugs (MCI3008)

What's it all about? Macadamia lace bug (MLB) has a significant impact on the macadamia industry, but the taxonomy, genetics and ecology of the insect remain poorly understood. Established in 2014, this project is investigating key aspects of MLB including lifespan, food sources and where they lay their eggs. The project is examining whether out-of-season flowering is driving outbreaks, how far individual insects can disperse and the genetics of the insect to determine whether there are 'cryptic' species infesting macadamias that may be overlooked.

What's the latest? The project continues to build a picture of MLB in Australia, with specimens being collected to map the number of species and their relationships. Earlier in the project, two species of MLB new to science were discovered – one in the Northern Rivers and one in Tasmania. Since then, another new species has been identified from the Snowy Mountains.

Recent sampling work in the project has included the collection of MLB samples in Atherton and the Glasshouse Mountains in Queensland.

Importantly, analysis has revealed the MLB species that infests macadamias in Atherton is a completely different species to that found in southern Queensland or in New South Wales. It has never been collected outside of the Atherton region, and no host plant other than macadamia is recorded for it. The researchers note that because macadamias are not native to the region, this means there is potential for MLB to change host plants.

The field visit to the Glasshouse Mountains coincided with an unprecedented MLB outbreak, with some growers experiencing total crop loss within a week. The species involved was found to be the novel *Ulonemia "howardii"*, whereas heavy infestations in the Northern Rivers were earlier found to be caused by *U. decoris*. The project team note this is the first time the undescribed *U. "howardii"* species has been recorded in plague proportions.

The project continues to work on identifying host plant species for MLB and on genetics, including research to understand the relationship between MLB species and other taxonomic groups.

Macadamia crop forecasting 2015-18 (MCI5009)

What's it all about? Macadamia crop forecasts are produced each year, designed to be accurate to within 10 per cent of the actual final crop. These forecasts provide a tool for improved decision-making for macadamia businesses and the wider industry, and help to maintain an informed, viable and sustainable industry. Long-term forecasts also allow planning for adequate infrastructure and industry marketing well in advance.

What's the latest? Work towards this year's forecast continues, including surveys of macadamia growers and pest scouts, which are to be integrated into regional and overall totals for a growers' forecast.

In 2016, the 52,000 t in-shell (at 10 per cent moisture) crop was slightly higher than the project's forecast of 50,000 t, and represented an 8 per cent increase on the previous year's crop.

Review of macadamia orchard nutrition (MCI5012)

What's it all about? This project focuses on improving the quality of soil and plant-nutrition advice for the industry. It has involved the investigation of current literature on and approaches to soil health and macadamia nutrition, and the development of guidelines and protocols involving soil sampling, soil analysis, and nutrition timing, amounts and frequency.

What's the latest? The project was originally due to conclude in 2016, after its review of macadamia orchard nutrition was presented to industry. Following industry feedback, the project was extended into 2017 to facilitate training workshops for macadamia industry consultants and advisors to further their understanding of soil and nutrition management. This training will ultimately improve the accuracy and consistency of advice provided to growers.

For growers, the key message is to work with your consultant to put an effective integrated orchard nutrition program in place to increase production and profitability. A full list of industry consultants is available on from the Australian Macadamia Society website.

Australian macadamia industry innovation and adoption program (MCI5004)

What's it all about? Beginning in 2016, this project aims to enhance the adoption of innovation and technology, and facilitate capacity building, in the Australian macadamia industry. It involves the work of a macadamia industry productivity development manager (MIPDM), Robbie Commens, who is responsible for a range of activities including:

- regular grower meetings and annual consultants' meetings
- MacGroup workshops and grower field days
- production of communication materials such as videos and content for industry publications
- managing emerging issues
- identifying and developing opportunities for new orchard territory and expansion.

What's the latest? Notifications for upcoming meetings and events under this project are distributed through Australian Macadamia Society channels, including the monthly e-newsletters. New resources have been developed such as a harvest strategy checklist and a harvest strategy tip sheet with grower experiences as well as videos of MacGroup presentations and a harvest trial.



MacGroups have proven to be extremely popular with growers in every macadamia growing region. In November 2016, growers in the Bundaberg region were treated to the lowdown on harvesting and harvesting equipment.

Determining the extent and causes of abnormal vertical growth (MCI5011)

What's it all about? This project, which has just been completed, has drawn together a team of experienced plant scientists and a network of industry agronomists to update and consolidate research information on the threat of abnormal vertical growth (AVG) in the macadamia industry.

It has been looking at the current impact of AVG and potential causes of the disorder, including the role of biotic agents in its development and spread, and will provide recommendations for future research required for management, predictors and diagnostics.

What's the latest? The project has just been completed, and plans for a second stage of the project are underway.

In 2016, farms in all major growing regions had been surveyed for incidence and severity of AVG, including farms in Baffle Creek, the Bundaberg area, and the Atherton Tablelands in Queensland, and Mountain Top, Jiggi, Caniaba and Hogarth Range in New South Wales.

The researchers reported that:

- AVG was more widespread and severe than in previous surveys
- severe AVG symptoms were observed in varieties previously thought to be tolerant or only moderately susceptible to the disorder
- irrespective of rootstock, HAES 344 trees were the most susceptible at all sites surveyed
- AVG status of 13 additional varieties had been determined, with six tentatively classified as tolerant
- AVG was observed in susceptible trees on various soil types.

Molecular analyses of AVG and non-AVG samples had also revealed the presence of geminivirus, bacteria and fungi in the samples, with initial observations suggesting an interaction between the geminivirus and bacteria in the progression of AVG. Work in this area was being progressed.



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Other R&D projects of note...

- Hort Innovation is currently establishing an **integrated pest management (IPM) program** for the macadamia industry. This multi-project program will develop and extend knowledge and practices to support macadamia growers in having pest-resilient farming systems. So far, the project has a coordinator under *Coordinator for the IPM program for the Australian macadamia industry* (MC16003) and new projects established with three different service providers: *The IPM program for the Australian macadamia industry – IPM Technologies* (MC16006), *The IPM program for the Australian macadamia industry – BioResources* (MC16008) and *The IPM Program for the Australian Macadamia Industry – NSW DPI* (MC16004). Further projects are to come.
- **Macadamia second generation breeding and conservation (MC14000)**, which began in 2015 to progress genetic improvement for the Australia macadamia industry, is working to produce new cultivars that will provide the industry an advantage over its international competitors. Specifically, the project is evaluating 3555 seedling progeny already established, and aims to increase the second generation population size by 10,000. Other significant activities of the project relate to the genetic control of husk spot disease and abnormal vertical growth, evaluating alternative breeding strategies, screening rootstocks for tree size control and productivity, and determining suitable pollinisers for elite selections.
- **Biological husk spot research (MC12008)**, currently focused on evaluating the biological control agent Macanizer for the control of the disease, and the subsequent production of a registration package for the product.

Acknowledgment. This content first appeared in Horticulture Innovation Australia's quarterly Hortlink publication, available in full at www.horticulture.com.au/hortlink-2017-edition-1. Remember that paying a levy doesn't automatically make you a member of Hort Innovation, but signing up is free and easy at www.horticulture.com.au/membership.

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MACADAMIA MEDIA FAMIL SOWS SEEDS FOR FUTURE PUBLICITY



Some of the famil's participants. Not only was it an excellent opportunity to share the macadamia story, it was also enjoyable. (l to r) Ken Dorey, Peter Fraser, Jeremy Bright, Tony Flick, Henri Bader, Mason Roy and Judy and Bob Howard.

In March, a media "famil" (familiarisation) in the Northern Rivers macadamia growing district hosted journalists from a range of Australia's most popular food, lifestyle and news titles. The two-day event was a huge success, with an itinerary that provided a taste of the many layers that make up the rich story of Australian grown macadamias.

Guests were treated to on-farm experiences, a farmers' market tour, cooking demonstration, macadamia fine-dining and beauty experiences and more, as they learned what makes the Australian industry tick, and the innovative ways in which our product is being used. It's anticipated the experiences and knowledge gained will inform a range of media coverage in the months to come.

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REGIONAL VARIETY TRIAL FIELD WALKS FOR 2017

Dougal Russell and Paul O’Hare, DAF, Nambour

Growers evaluated the recently released, elite macadamia selections from the industry breeding program at Regional Variety Trial (RVT) field walks in March in Bundaberg and Alstonville. Varieties G, P and J have been selected for release by the Macadamia Industry Varietal Improvement Committee (MIVIC) based on their performance to date in Bundaberg. Varieties G and R have been selected based on their performance in Alstonville. The new selections were compared with the industry standards 741 and 816 in both locations. The trials were planted in 2008 and have been harvested for four years so far.

Growers estimated the nut-in-shell yield of the new selections and rated them from 1 to 9 for husk spot severity, tree habit, canopy density and commercial potential, as follows:

- husk spot – selections were rated from 1 (no husk spot present) up to 9 (severe husk spot present)
- tree habit – trees were rated from 1 (very upright) to 9 (very spreading)
- canopy density – tree canopies were rated from 1 (very open) to 9 (very dense)
- commercial potential – selections were rated from 1 (no potential) to 9 (excellent potential) with seven considered to be commercially acceptable.

Bundaberg field walk

At the Bundaberg field walk, held 2 March 2017, MIVIC members and local macadamia growers rated the new selections at the RVT sites at DeCortes and Booyan and at a nearby supplementary grower trial site.

There was strong interest in selection G and very strong interest in selection P. Husk spot was not rated as an issue on any of the varieties being assessed.



Growers at the Bundaberg RVT field walk assess varieties.

On the two RVT sites, growers estimated selection P had a higher yield to 816, in fact the highest estimated yield of the varieties assessed, but the tree canopy volume was only 50 to 60% of 816. P and G rated higher for overall commercial potential compared with 741 and 816 (see Figure 1). G is considered a medium to large, productive and open tree while P is small to medium, spreading and precocious.



Figure 1. Mean grower ratings and scores for Bundaberg field walk.

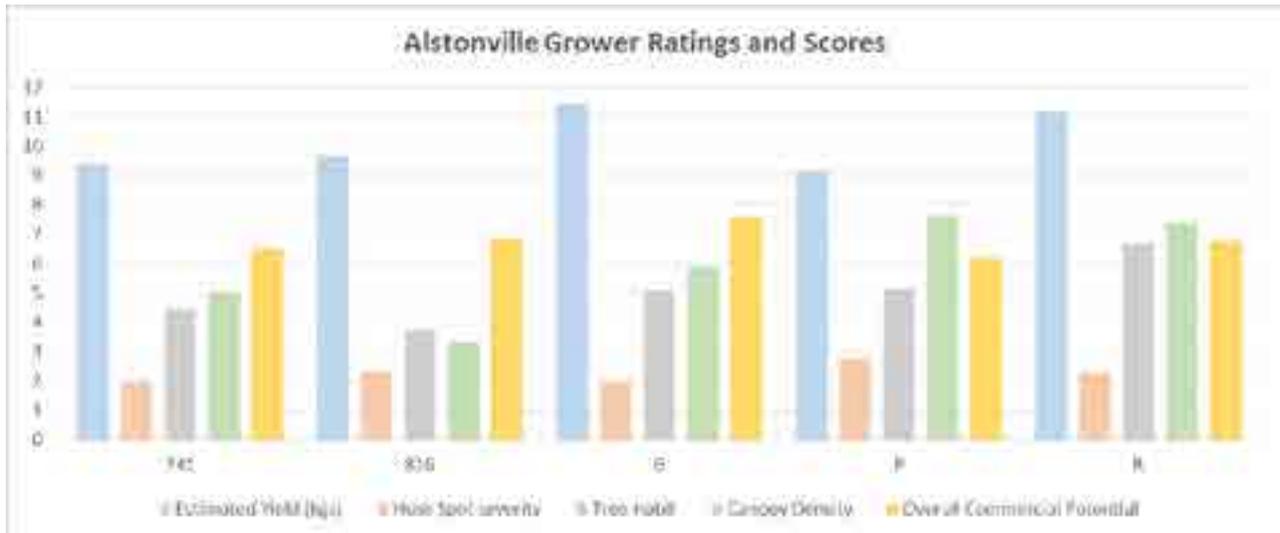


Figure 2. Mean grower ratings and scores for Alstonville field walk.

Grower comments for P included:

- “Very open tree, excellent yield and canopy”
- “Most promising”
- “Suitable as a high density tree”.

Alstonville field walk

NSW growers and members of MIVIC rated the selections for yield, husk spot susceptibility, tree growth habit, canopy density and commercial potential at the Alstonville RVT field walk 23 March 2017.

The growers present rated selection G as the best performing variety compared to the industry standards. Growers considered G to have higher commercial potential (mean rating of 7.6) than 741 (6.5) and 816 (6.9). P did not rate as highly in Alstonville as it did in Bundaberg because of its canopy density as it was considered that this could affect light and spray penetration. P had the densest canopy with a mean rating of 7.6 compared with G (5.9) and 741 (5.1). It is important to note that the canopy of P was not rated as dense at the Bundaberg RVT sites.

Grower comments about selection G included:

- “Crops well from top to bottom”
- “Even yield throughout tree, no nut on outside - suitable to hedge”.

Results from the grower evaluations indicate that selections G and P are more suited to the Bundaberg region while G is suited to Alstonville. Feedback from the field walks indicates that G is considered an “all-rounder” being precocious and high yielding in both locations. P appears to be best suited to the Bundaberg coastal plain.

Growers in both Queensland and NSW have taken the opportunity to order trees of the new varieties through the expression of interest process with the Queensland Department of Agriculture and Fisheries (DAF). For information on how to order contact the DAF Business Manager Jodie Campbell at Jodie.Campbell@daf.qld.gov.au.

All RVTs will be harvested again in 2017 to confirm yield and quality results. This will also provide more information on the performance of the selections in Emerald, Mackay and Macksville where the trials are one year younger.

Information

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This project has been funded by Horticulture Innovation Australia Limited using the research and development macadamia industry levy and funds from the Australian Government.





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SKY-HIGH TECHNOLOGY FOR BETTER DOWN-TO-EARTH FARMING DECISIONS

Andrew Robson, University of New England Armidale

Remote sensing technologies such as satellite and aerial imagery combined with ground-based technologies have been around for decades. Today modern agriculture and horticulture are using these technologies to develop applications that can improve on-farm management strategies, yield and quality mapping, response to biosecurity outbreaks and post disaster monitoring.

The potential application of remote sensing is central to a national horticulture project, *Multi-scale Monitoring Tools for Managing Australian Tree Crops - Industry Meets Innovation*, which combines innovative technologies such as satellite mapping, laser scanning and on-ground robotics with citizen science apps. The aims are to identify what technologies best deliver industry-specified outputs such as the monitoring of tree health, productivity and quality as well as supporting improved response to biosecurity and natural disaster recovery.

The project is being conducted on selected horticulture tree crops (macadamia, avocado, mango and banana) across Australia and involves the AMS, Avocados Australia, the Australian Mango Industry Association, four universities, government agencies, industry partners, grower groups and commercial providers.

A lot has happened since we last reported on the project in May 2016 so let's take the opportunity to find out how the project is developing and how you can get involved.

Web map for improved industry biosecurity and natural disaster recovery

The project's first component, a national map, is being compiled from imagery, industry and government crop databases, regional surveys and on-ground

evaluations to map the location and area of every commercial (>2 ha) avocado, macadamia and mango orchard across Australia.

Data will be used by industry to develop a better understanding of growing area and it will underpin improved biosecurity and post-natural disaster

response and monitoring. For example, in the event of a disease outbreak, industry groups can access the map and know exactly where surrounding crops are and quickly develop management strategies. The product can also be used to map disasters like floods, fires and cyclones and speed up applications for recovery assistance. In fact, the map is already providing critical information to the natural disaster response and recovery effort in the wake of the devastating Category 4 Tropical Cyclone Debbie, which crossed the Queensland coast on Tuesday 28 March.

Draft mapping was launched in April, and this is your chance to

contribute through the *Industry Engagement Web Map*. We encourage and welcome the input of locals to review the draft mapping and add your comments. These comments will be integrated into the final mapping due in September 2017.

The map, which is accessible from any desktop or mobile device web browser and requires no user account or subscription, uses coloured polygons to identify horticultural land-use classes (avocados, macadamias, mangoes) on the base satellite imagery.

FURTHER IMAGERY CAPTURES AND ASSOCIATED GROUND-TRUTHING IS CURRENTLY BEING REPEATED IN THE BUNDABERG REGION AS WELL AS AN ADDITIONAL REGION IN THE NSW NORTHERN RIVERS REGION.

High-tech decision support tools for improved orchard management

The second component of the project is the use of innovative technologies, including high-resolution satellite imagery, on-ground and airborne robotics and hand-held sensors, to develop decision-support tools that help farmers improve orchard management, understand variability in yield and quality and offer improved monitoring of pest and disease occurrences.

The applications will support improved management of crop inputs (e.g. how much fertiliser and where), harvest segregation based on quality and fruit size, and labour efficiencies, all of which offer great financial benefit to growers. They could also help with tree health monitoring, including early detection of pest and disease outbreaks, traceability, yield forecasting and evaluating root stock performance.

Predicting tree health, nut yield and quality from space

In just one example of the types of decision-support tools the project is developing, early results have indicated the capacity of high resolution satellite

imagery for mapping the spatial variability of macadamia tree health, yield and nut quality across an orchard.

Project members working in the Bundaberg region have been able to identify a relationship between the canopy reflectance properties of the macadamia tree seen in the satellite imagery to nut yield measured from 126 individual trees from seven separate orchard blocks. This relationship means that it may be possible to predict total nut yield in a macadamia block before harvest as well as develop a surrogate yield map.

Further imagery captures and associated ground-truthing is currently being repeated in the Bundaberg region as well as an additional region in the NSW Northern Rivers region. This fieldwork is being conducted in collaboration between UNE and the macadamia consultants Chris Searle (Bundaberg) and Janus Erasmus (NSW).

The outputs from this research will be reported to industry with the aim to implement them in a tailor-made decision support tool.



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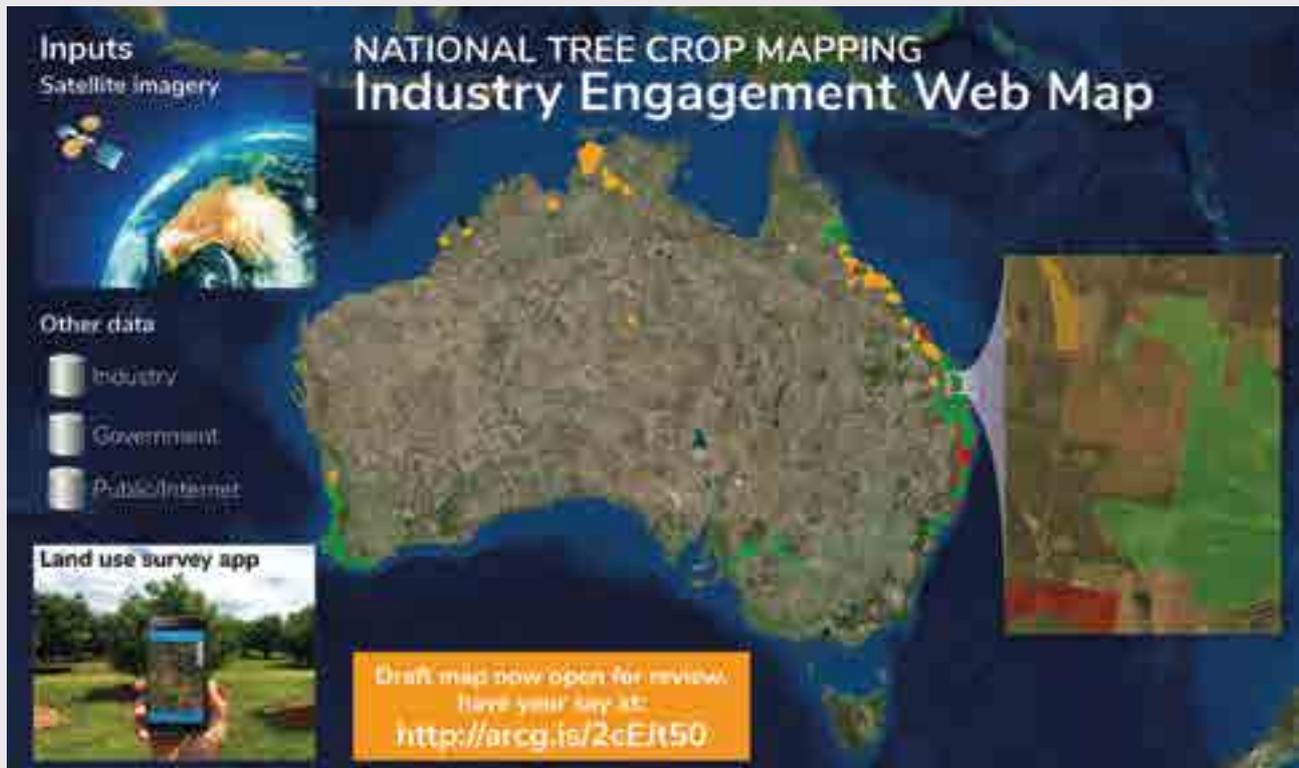
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YOUR CHANCE TO COMMENT



The web map currently presents draft mapping. We are inviting growers and industry stakeholders to spend a few minutes to review the draft mapping, compare it with your local knowledge and suggest how it might be improved.

You can submit your comments about information that is missing, incorrect or misclassified using

an easy pop-up window with predefined options in dropdown menus. These comments are collected in real time so that once the comment window is completed it will be synchronised for other users to see. To find the map and add your comments, go to website www.arcgis.com and search for "Industry Engagement Web Map".

You can also use the free *Land Use Survey app* (iOS and Android) to inform the classification of tree crops by capturing GPS-coded point observations and photos. Comments and data collected via the map and app will be interpreted before the final mapping products are compiled and released in September 2017.

Information

For information about the greater project, contact Associate Professor Andrew Robson, Agricultural Remote Sensing Team: Precision Agriculture Research Group, University of New England, Armidale.

P: 02 6773 4085

E: andrew.robson@une.edu.au

For information about the web map and cyclone Debbie response, contact Craig Shephard, Principal Scientist, Remote Sensing Centre, Queensland Land Use Mapping Program (QLUMP), Department of Science, Information Technology and Innovation, Brisbane.

P: 07 3170 5664

E: Craig.shephard@dsiti.qld.gov.au

Acknowledgment

The National Tree Project is funded through the Australian Government's Rural Research and Development (R&D) for Profit Grants Programme, managed by Horticulture Innovation Australia Ltd and led by the University of New England. The success of the project can be attributed to the multi-disciplinary team from industry, research/academia and government, including The University of Queensland, University of Sydney, Central Queensland University, Agtrix Pty Ltd, the Queensland Department of Agriculture and Fisheries, Queensland Department of Science, Information Technology and Innovation, and Simpson Farms Pty Ltd.

This project has been funded by Horticulture Innovation Australia Limited using the research and development macadamia industry levy and funds from the Australian Government.

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PROJECT LOOKS TO WAYS OF IMPROVING HARVEST PERFORMANCE

Research by the NSW DPI and the AMS suggests that the Australian Macadamia industry is missing out on more than 15% of production due to harvesting losses and quality downgrades. With the five-year average yield at 3.3 t NIS/ha this means about 0.5 t NIS/ha in lost production annually at a value of \$2,600/ha (at \$5.20/kg). There is scope to capture some of this lost value. AMS believe that at least 7% of harvest losses can be captured through small changes to the harvest system equating to an additional revenue of \$1,200/ha across macadamia farms in Australia.

Opportunities for the industry to re-capture this lost revenue are being investigated in *Macadamia Harvest Improvement Review* (Project MC16001), a new research project to increase harvest performance across the industry. Hort Innovation Australia have invested \$200,000 in the project, which began in March 2017 and is due for completion in January 2019.

The project team, led by the Colere Group, brings together a partnership from the National Centre for Engineering in Agriculture (University of Southern Queensland), the University of Queensland and AgTrans Research. The team is working closely with the AMS to deliver practical options for capturing lost revenue.

While the project will investigate agricultural engineering and cultural and management practices, its first priority will be to understand the extent of losses across the growing regions. It will then move on to developing potential solutions to reduce the harvest window, manage nut drop and improve nut harvest.

Dr Simon Speirs from the Colere Group said that the project will build on previous exploratory work by the CSIRO into the physiology of abscission in macadamias, including testing several potential plant regulators. It will also investigate innovative products that other tree crop industries are using around the world and how they may help growers to increase production and productivity in both the short and long term.

The Colere team are reviewing existing science and extension information, as well as interviewing and surveying growers to quantify the current state of losses and to map potential solutions. A series of pilot trials will be run at two farms to test selected harvest options (such as shaking technology), pruning options and presentation of nuts on tree as well as incremental improvements on current equipment.

One of the long-term benefits from this project is that the team will provide recommendations to

Hort Innovation and the AMS on further harvest engineering and management tools to address this industry issue, helping to target future RD&E investment.

Information

If you are interested in more information contact the Colere Group at solutions@colere.com.au or call Dr Simon Speirs at 0413 577 292.

This project has been funded by Horticulture Innovation Australia Limited using the research and development macadamia industry levy and funds from the Australian Government.

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MEET THE RESEARCHER

In this edition's Meet the Researcher, we catch up with Grant Thorp who is a researcher with Plant & Food Research Australia working on a HIA funded project looking at propagation, precocity and early tree establishment of macadamias. Grant provides an insight into his work with macadamias and potential future developments.



NB. How long have you been working in the macadamia industry and what is your role?

Grant. I started working with the macadamia industry in spring 2014. My role has been to take a fresh look at macadamia canopy management using my 33 years' research experience with a range of temperate and subtropical tree crops. I am particularly interested in the development of new orchards, starting with the type of tree produced by nurseries, how well these trees establish in the orchard and the time taken for these trees to produce their first commercial harvest.

I have worked on similar projects with avocado and apple and in 2014 I had started a new project with the Australian almond industry to change the way they grow almonds. So there are plenty of opportunities to transfer knowledge gained from these crops across to macadamia.

My initial project with macadamias was to compare the growth/performance of traditional grafted trees with the "new" mini-grafted trees being produced by some nurseries, all with seedling rootstocks, and to compare these with "clonal" cutting grown trees. The first trial was planted on old sugarcane land near Maryborough in September 2015. We are expecting our first crop in 2018.

My early impressions from these trials were that young macadamia trees do not readily produce branches unless they are forced to (by severe pruning), and that the trunks of macadamia trees are very slow to thicken up and so require staking to support strong canopy growth.

With this in mind, new projects were established to compare different types of pruning and the use of plant growth inhibitors to produce a smaller tree with a thicker trunk that did not require pruning or staking. Of course, the acid test for these treatments will be

that they do not inhibit flowering and do not delay the time taken for trees to produce their first commercial harvest. At this stage the results are promising and it appears that a useful plant growth inhibitor treatment could be developed to eliminate at least one round of pruning on young trees.

Along these lines, I also have projects in the Northern Rivers district, also on old sugarcane land. Here I am working with 3- and 4-year-old trees and evaluating the use of trunk girdling to stimulate flowering and increase yields on young trees. Results from Year 1 have been extremely interesting with substantially higher yields in response to girdling.

NB. What will be the focus of your work for the next 12 months?

Grant. This spring is going to be interesting. Will there be similar numbers of flowers on the traditional and mini-grafted trees? Have the pruning and/or plant growth inhibitor interventions used to produce smaller trees with larger trunks also reduced flowering? Have the higher yields this year on the young girdled trees reduced their cropping ability in the next season? Can we repeat girdle young macadamia trees and achieve similar improvements in yield? This is all new territory that has the potential to change the way growers establish their new orchards and manage their young trees.

NB. What do you enjoy most about your job?

Grant. The best part of my job is that there are always opportunities to take on new challenges, to work with new industries with different crops growing in different regions and countries and to help people make a difference. My approach has been that once you understand the principles involved, you can adapt and modify systems to better suit these different situations.

**" RESULTS FROM YEAR 1
HAVE BEEN EXTREMELY
INTERESTING WITH
SUBSTANTIALLY HIGHER
YIELDS IN RESPONSE TO
GIRDLING".**

NB. How important is it that your work delivers practical outcomes for growers?

Grant. While my passion is to have a better understanding of plants and plant growth, the key driver for me is the opportunity to work with industry and to use my experience to help growers challenge current production systems and to set new sustainable production targets, summed up as "higher yields of better quality fruit at no extra cost".

In my career as a researcher I have seen kiwifruit and apple yields almost double every ten years, with reduced orchard inputs. Over the same time period yields of most nut crops, including macadamia and almonds, have hardly changed. Why is this? Why are some growers willing to accept the status quo while others are continually setting new aspirational targets?

NB. What are your predictions for advances in macadamia orchard management in the next five years?

Grant. I only have a brief history and knowledge of the macadamia industry so it is difficult for me to make predictions about future industry development. However, with the current expansion of new plantings there will be opportunities for new players to examine current industry practice and to build on the new knowledge, not only from the research I am responsible for, but also from the Queensland *Small Tree – High Productivity* research program. With a dynamic industry driven by innovation I believe it is inevitable that the advantages of higher density planting systems with earlier, higher profits will prevail.

NB. Best book you have read in the last 12 months and where is your next holiday going to be?

Grant. *A Little History of the World* by E. H. Gombrich. Just returned from seven days hiking in the back country of Fiordland National Park NZ. Next holiday? North Stradbroke Island.

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RESEARCH & DEVELOPMENT PROJECTS - your levies at work

The industry levy collected by the Levies Revenue Service (LRS) goes to 1) the National Residue Survey (NRS) for residue testing and 2) Horticulture Innovation Australia (HIA). HIA administer the levy on behalf of the Government according to our industry strategic plan. Currently the levy funds from HIAL are channelled into: a) marketing and promotion, b) research and development (which is matched dollar for dollar by the Commonwealth Government).

Summarised below are the research and development projects being funded by your research and development levy and voluntary contributions.

Project no.	Project name	Delivery partner	Jul - Dec 2016 (\$)
MC12007	Disease management in Macadamia Industry	The University of Queensland	10,000
MC13008	Biology, species and genetic diversity of Macadamia lace bugs	University of NSW (UNSW)	23,125
MC15003	National macadamia grower communications program	Australian Macadamia Society	132,181
MC15004	Australian macadamia industry innovation and adoption program	Australian Macadamia Society	154,058
MC15005	Benchmarking the Macadamia industry 2015-2018	The Department of Agriculture and Fisheries (DAF)	76,863
MC15009	Macadamia crop forecasting 2015-2018	The Department of Agriculture and Fisheries (DAF)	12,647
MC15010	Ecology and management of Sigastus weevil in macadamias	NSW DPI	15,000
MC15011	Determining the extent and causes of abnormal vertical growth	The University of Queensland	30,000
MC15012	Review of macadamia orchard nutrition	The Department of Agriculture and Fisheries (DAF)	30,000
MC15014	An IPM Programme for the Australian Macadamia Industry	NSW DPI	1,561
MC16003	Coordinator for the IPM Program for the Australian Macadamia Industry	Daniel Ryan	6,039
MC16006	The IPM Program for the Macadamia Industry – IPM Technologies	IPM Technologies Pty Ltd	14,920
MC16008	The IPM Program for the Macadamia Industry – BioResources	BioResources Pty Ltd	16,000
MT13061	Understanding the Purchase Behaviour of Fresh Produce Consumers	The Nielsen Company	13,490
MT14006	Export - Import Market Intelligence Project 2014 - 2016	Fresh Intelligence Consulting	2,108
MT15032	Strategic Investment Planning	AgEconPlus Consulting	80,274
MT16006	Update of the Hi-Link model of Australian horticultural industries	The Centre for International Economics	1,283
TOTAL			620,859

Note: In addition, most research and development projects also have significant in-kind support from the agencies who are managing them. Information about the research and development (including completed project reports) funded by the industry levy is available at www.australian-macadamias.org and www.horticulture.com.au



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Benefits:

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- Apply to 2 rows per run
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During harvest, growers spend a lot of time on their machines which gives them the space to ponder opportunities for further improvement. The AMS has pulled together this advertorial feature to showcase some of the new equipment being released to the macadamia industry. We understand that not all equipment suits everyone, and not everyone suits all equipment, but we hope that you find some value in the next few pages.

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The Ferris IS 5100Z series of diesel-powered zero-turn mowers delivers the ultimate productivity in a commercial zero-turn lawn mower.

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The mower features Hercules™ II cast-iron mower spindles with oversized 62 mm industrial double-row, angular contact ball bearings, 30,16 mm shaft and 257 mm six-bolt flange design. The expanded operator compartment includes ergonomic control

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TORO

Count on Neptune dripline from Toro

Toro's recently released Neptune dripline is ideal for macadamia orchards. Neptune is available as a pressure compensating dripline and as a non-drain dripline. The non-drain dripline can be safely laid on the orchard floor with minimal risk of soil getting into the drippers and causing blockages.

Frank Nocera, Product Manager, Irrigation with Toro, is impressed with the range of pressure compensation.

"Testing has demonstrated very even flow rates over a range of inlet pressures from 50 to 350 kPa. This evenness of flow rate has been demonstrated over all the different emitter flow rates and spacings," said Frank.

"This means that Neptune can be used in long-run lengths and on undulating ground, common to macadamia orchards."

Another very important feature is the Neptune dripline's emitter. It has a large inlet filter which,

combined with the large cross section labyrinth, provides clog free, reliable operation.

The Neptune non-drain variety is particularly suited to pulse irrigation and in systems installed on steeply varying terrain. It also means that because the system retains water after it has been turned off, there are energy savings when it is restarted.

The Australian manufactured Neptune is available in three emitter flow rates - 1.0, 1.6 and 2.4 L/hr - and in emitter spacings ranging from 0.3 to 1.0 m.

The heavy wall dripline is manufactured in Australia for Australian conditions, from high quality materials making it ideal for use over several seasons. Neptune Dripline is supplied with diameters that suit Australian standard fittings, making it a product to count on.

For information go to the Toro website, www.toro.com.au

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Avocado grower Gordon Burch, from Port Macquarie, is an advocate for how the saw, which is “like a pair of giant hands”, has helped his business.

Gordon would usually employ a number of staff to prune and still wouldn’t be able to get through all the work, in part because of the complexity of the trees in the orchard. With the grapple saw, he said it has taken three or four hours to do what would have once taken four men a week to do.

Calculating what it would take for the grapple saw to complete pruning over the whole orchard and comparing this to the labour required, Gordon concluded that the time and labour saving benefits are huge.

“We never would have been able to do this as efficiently and as cost effectively as we were able to do it with this grapple saw,” he said.

The safety implications of using a grapple saw are also considerable compared to having a number of staff with chainsaws in tight rows dropping mature orchard trees that can grow up to 15 m and higher.

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TUFFASS MACHINERY

Tall trees a real challenge

In the Lismore, Sunshine Coast and Gympie areas, many orchards have trees that are higher than 14 m. A consequence of this is that spraying effectively at this height is a real challenge to the industry.

Tuffass Machinery Pty Ltd in South Lismore has stepped up to this challenge, building and developing a new model Tuffass/Bora to perform this task successfully even with low HP tractors (85 HP).

Most orchard sprayers currently in use were originally designed more than 40 years ago to spray trees up to 6 m in height. These sprayers have since been modified over time to work as best they could, but they are still based on using the original low volume, low pressure machines as a starting point.

The Tuffass/Bora macadamia sprayer has been developed over two years to suit macadamia trees between 6 and 15 m high. The sprayer has at its heart high volume, high pressure brass pumps. These supply large, adjustable cannon nozzles which produce large droplets to ensure good coverage at height with minimal excess spray drift.

The twin hydraulic adjustments on the slim tower give it the capability to operate on any terrain and deliver directed spray into the right section of the canopy, not to the air above it (creating drift).

The unique fan design produces and directs more air than most double-sided sprayers, while producing lower noise levels than the tractor operating it.

Dennis Whitney, who grows macadamias near Nimbin in the Northern Rivers, once said that he couldn't possibly use a single-sided sprayer because it would take twice as long to do the job.

Now, his opinion has changed, and Dennis says after using his Tuffass/Bora sprayer last season he has proved that it doesn't take twice as long.

While it takes the same time to fill, mix chemicals, travel and clean the tank, Dennis said that the real difference is in the sprayer design.

"I'm now getting good coverage on my ten- to fifteen-metre-high trees, while travelling at 4.2 kilometres an hour instead of 2.9 like before," he said. "And it fits through my seven metre rows easily with its unique narrow tower design which can be also folded down to fit into a standard garage door."

"To achieve proper spray coverage on these tall trees with a minimal HP tractor didn't seem possible until now - I couldn't be happier with the whole package," Dennis added.

For more about the Tuffass/Bora, go to website www.tuffass.com.au

Bobcat + mulcher adds up to great idea

During his trip to north Queensland earlier this year, Brice Kaddatz said a highlight was seeing this bobcat-mounted mulching machine in action. The machine is being used on the Inderbitzen family's avocado orchard (Kureen Farming), which was originally a macadamia orchard owned by Col Cumming.

According to Brice, it accepts 8' rectangular hay bales and "spits them out beautifully" along the row and under the trees. The machine lays hay mulch up to 600 mm thick (dry) down the tree row, taking only minutes per bale. Kureen Farming grows the hay, and then uses a contractor to bale and spread it. The cost is about \$50 per bale.



DIGGA

New application for Digga

A chance phone call from a northern New South Wales grower enquiring about using a road sweeper on his orchard introduced Digga to a new application for a product they had been manufacturing for over 20 years.

John Pretorius was looking to move mulch that had been washed away back under the trees and over the roots without damaging the orchard floor. After looking at several different options he decided to give the sweeper a try. Its success, coupled with John's enthusiasm about finding a solution to the issue of how to keep roots covered to increase a tree's productivity, meant word soon spread in the industry.

An additional benefit was also stumbled upon - the sweeper helped recover embedded nuts from the ground improving yields and profitability.

The sweeper is proudly made in Australia at Digga's 12,500 m² manufacturing facility located 20 minutes north of the Gold Coast. Digga began as a wear parts supplier in 1981 and started manufacturing its own

augers the following year. Auger drives and trenchers soon followed and now Digga manufacture over 70 different ranges of construction and agricultural machinery attachments. Digga's state-of-the-art facility includes the latest laser cutting, break press, welding and CNC machining technology and produces 80% of all components in-house, including gearboxes.

The sweeper, or angle broom as it is commonly called in the earthmoving industry, is suitable for tractors, skid steers loaders and utility vehicles and is available in widths of 1.8, 2 and 2.5 m. An offset frame was also developed to allow the broom to work further under tree branches.

With over 60 units sold to macadamia growers to date and positive feedback on the success of the sweeper, Digga is keen to continue to support the Australian macadamia industry.

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Farm Moto in Lismore has long been regarded as a supplier of the best equipment, and since the change in ownership, the family team has worked very hard to make our after-sales service even better. We have done this by implementing improved processes, upskilling our staff and employing additional experienced staff. Farm Moto is very proud of our strong relationship with the macadamia industry and we understand the needs of growers, regularly going above and beyond to meet those needs.

The recent flood was disruptive to say the least, but testament to the support we have received from our suppliers has been the reduced pricing offered exclusively to Farm Moto and residents of the Northern Rivers from Toro Australia and Polaris Australia. So, no need to wait for Primex!

Remember that you'll always get the best value by investing in the best products backed by the highest level of locally based ongoing training, support, servicing and spare parts.

Talk to Farm Moto about the current rebates available and the \$20,000 accelerated depreciation for small business, which expires 30 June 2017.

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L to R: Paul O'Hare, Shane Mulo, Ingrid Jenkins, Robbie Commens, Jeremy Bright, Grant Bignell

The macadamia benchmarking project (MC15005) is a joint initiative of the Queensland Department of Agriculture and Fisheries, the University of Southern Queensland and NSW Department of Primary Industries, with support from the Australian Macadamia Society. The project has been funded by Horticulture Innovation Australia Limited using the macadamia levy and funds from the Australian Government. The Queensland Government has also co-funded the project through the Department of Agriculture and Fisheries.

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PERFORMANCE OF THE TOP 5% OF FARMS

Improving productivity has been a key focus for the Australian macadamia industry in recent years. Analysis of the top performing farms is useful, not only to understand what is achievable, but also to try to identify what factors drive high productivity.

Production and quality data has been collected for the last eight seasons as part of the industry benchmarking project. Cost data has also been collected for the last four seasons. The data sample includes all major production regions, irrigated and non-irrigated farms, trees aged from one to 46 years and farm sizes from less than 2 ha to more than 400 ha. The benchmarking team has been investigating farms that have achieved high average productivity over many seasons. This article compares the performance of those farms with the wider benchmark pool.

Understanding production variability

Productivity varies significantly within the benchmark sample, between both farms and seasons. When looking at mature farms in the sample (older than 10 years) over the last eight seasons, commonly the variation observed for any given farm was around 28% of its average production. In other words, a farm with average seasonal

production of 100 t of nut-in-shell was likely to see that production range from 86 to 114 t over those seasons.

Severe weather events such as storms, cyclones and droughts certainly affect production in specific seasons. Other climatic conditions such as wet weather at flowering and dry weather during critical oil accumulation stages of nut development have also significantly affected productivity in some regions and seasons. Other factors such as seasonal pest pressure, canopy management and changes to nutrition or orchard floor management also influence seasonal productivity. While there are many instances of outstanding farm productivity in particular seasons, the influence of factors such as these mean that consistent productivity over multiple seasons is far less common, even among farms with high average productivity.

Productivity also varies significantly between mature farms in any given season. For example, in 2016 nut-in-shell production for mature farms in the benchmark sample ranged

from less than 1 t/ha to more than 6 t per bearing hectare. This range in productivity varies according to season and production region. Average farm productivity has varied less in the Central Queensland region, for example, than in all other production regions over the last eight seasons.

Given this variability between farms and seasons, what do the top performing farms look like and how are they performing in relation to the industry average? The following figures compare seasonal results for the top 5% of farms in the benchmark sample with the middle 50% of mature farms in the sample. To minimise the impact of seasonal variation, these groups are based on average farm productivity of saleable kernel per bearing hectare over at least four seasons. The top 5% therefore comprises 14 farms tracked over a number of seasons. Each season of data for a single farm is referred to as a farm year. The top 5% is based on 95 farm years. The middle 50% of farms comprise 120 farms tracked over multiple seasons for a total of 744 farm years.

What do the top performing farms look like?

Figure 1 shows the distribution of the top 5% of farms by region, farm size and tree age. More than 60% of the top performing farms were located in the Northern Rivers region of NSW compared with 54% for the middle 50%. Twenty-nine per cent of top performing farms were in South-East Queensland, divided equally between Gympie and Glasshouse Mountains. The Mid North Coast region of NSW represented 7% of the top performing farms.

There were no farms from the Central Queensland region in the top 5% although the average age of farms in this region is substantially lower than other production regions. Given the relatively high productivity of farms in this region in recent years it is foreseeable that it will be represented in the top 5% in the future.

The average farm size for the top 5% was 16 ha compared to 44 ha for the middle 50%. As many of the larger farms in the benchmark sample are from the younger Central Queensland region, a lot of these are yet to reach their full bearing potential. There is no significant difference in average planting density between the top 5% (305 trees per hectare) and the middle 50% (318 trees per hectare).

The average tree age of the top 5% (20 years) was very similar to that of the middle 50% (19 years).

Comparison of farm performance

Figure 2 shows average productivity, quality and income for the top 5% of farms compared with the middle 50%. Average nut-in-shell production per bearing hectare for the top 5% was 77% higher than the middle 50% for the 2009 to 2016

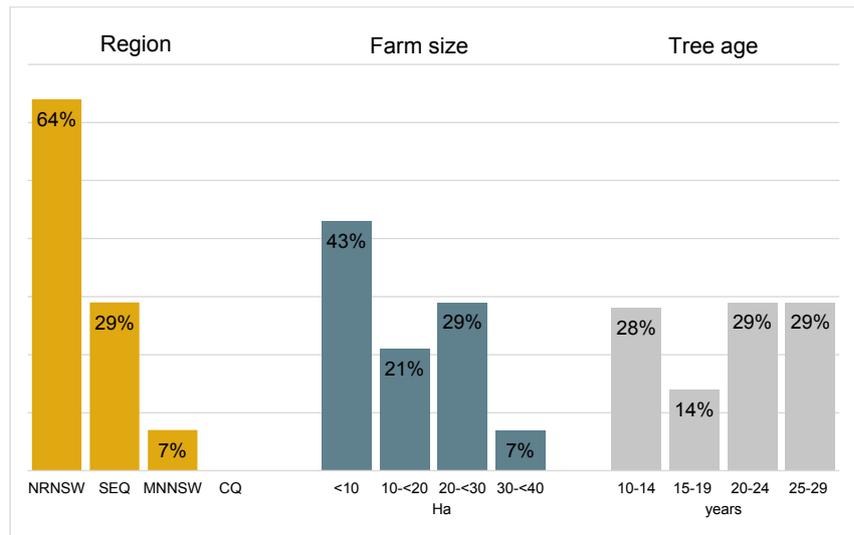


Figure 1. Distribution of the top 5% of farms by region, farm size and weighted average tree age.

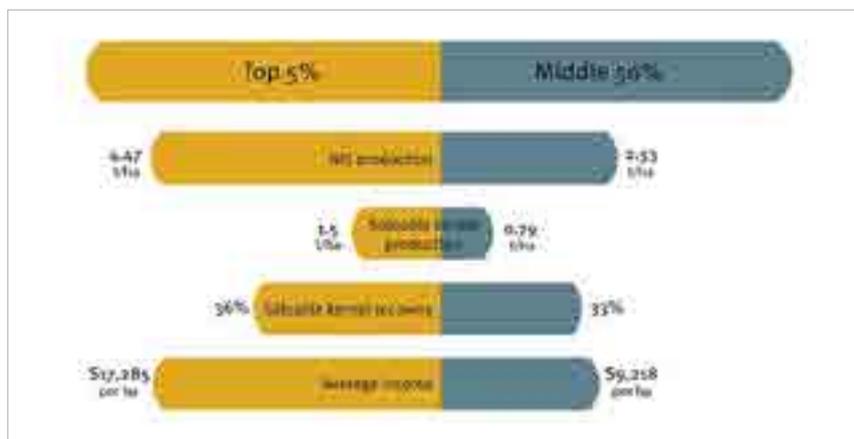


Figure 2. Production, quality and income for top 5% farms compared to middle 50% farms

seasons. Average saleable kernel production was 90% higher than the middle 50% for the same period.

The top 5% of farms achieved approximately 3% higher average saleable kernel recovery than the middle 50%. The top 5% also averaged a lower reject kernel recovery (2.1%) compared with the middle 50% (2.8%).

The comparison of average income per hectare is based on average annual nut-in-shell prices from 2009 to 2016. The top 5% of farms achieved much higher average income per hectare, mainly because of their higher average productivity. The combination of increased yield and kernel recovery among the top

5% equates to a difference of more than \$8000/ha in average annual income when compared with the middle 50%.

Figure 3 shows annual saleable kernel production for the top 5% and middle 50% of farms. Seasonal production trends are similar for both groups of farms. The obvious difference is that the top 5% have much higher average margins, which provide a buffer in challenging seasons. Even in the 2013, season when average productivity fell sharply, the top performing farms still averaged well above even the most productive seasons for the middle 50%.

Figures 4 and 5 show the difference between the top 5% and the middle 50% for saleable and reject kernel recovery respectively. The top performing farms have a higher average saleable kernel recovery than the middle 50%. Seasonal variation in average saleable kernel recovery is also lower among the top performing farms than the middle 50%.

Average reject kernel recovery for top performing farms from 2009 to 2016 was 0.6% lower than the middle 50%. The large variation between the two groups in 2011 was caused by brown centres (or internal discolouration), which mainly affected farms in the middle 50%. Despite a major spike in rejects in 2013, the average for the top 5% remained well below the middle 50%.

Farms in the top 5% had lower levels of reject kernel in all categories except germination. The most notable differences between the top farms and the middle 50% were in immaturity and internal discolouration.

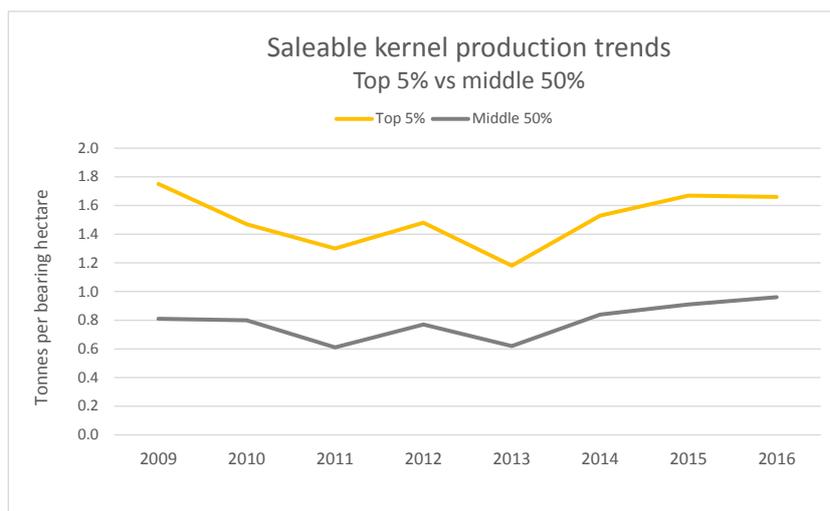


Figure 3. Saleable kernel production for the top 5% and middle 50%.

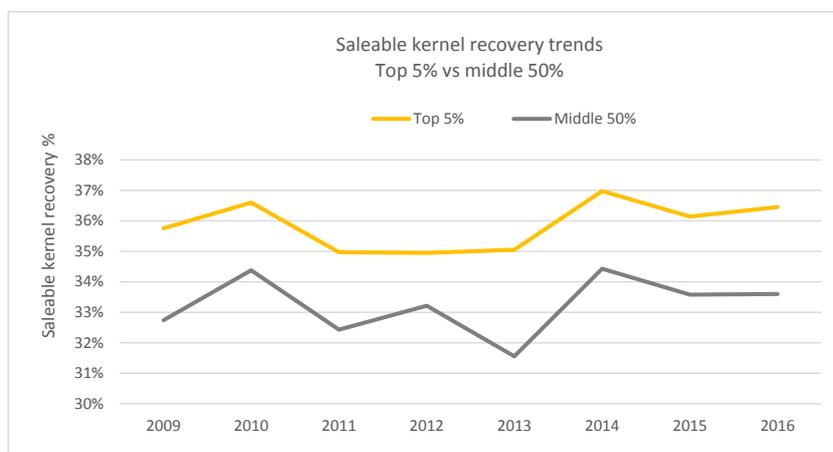


Figure 4. Saleable kernel recovery for the top 5% and middle 50%.

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THE DATA ALSO SHOWS THAT TOP PERFORMING FARMS ARE ABLE TO REMAIN PROFITABLE IN THE LONG TERM, REGARDLESS OF CLIMATIC OR OTHER SEASONAL INFLUENCES.

What is the impact on profitability?

Figure 6 shows average annual gross margins per hectare for the top 5% compared with the middle 50%. Gross margin is a profitability measure that is based on the difference between income and costs. The revenue in the following gross margins are based on average annual nut-in-shell prices. Costs are based on a single average annual figure of \$5,980/ha, which represents the average cost for mature farms in the benchmark sample between 2013 and 2016.

As seen in previous figures, the most obvious difference between the top 5% and the middle 50% is evident in their margins. Even in the most challenging seasons such as 2009, 2011 and 2013, the top 5% of farms remained profitable.

What does it mean?

The data suggests that there is potential to raise average farm productivity across the industry. This is further supported by growers who have experienced sustained yield gains through orchard rejuvenation and management changes in recent years.

The data also shows that top performing farms are able to remain profitable in the long term, regardless of climatic or other seasonal influences. Given that these top performing farms span a range of regions, tree ages and farm sizes, it's likely that their productivity is determined by a range of other factors.

Current industry initiatives and case studies are looking more closely

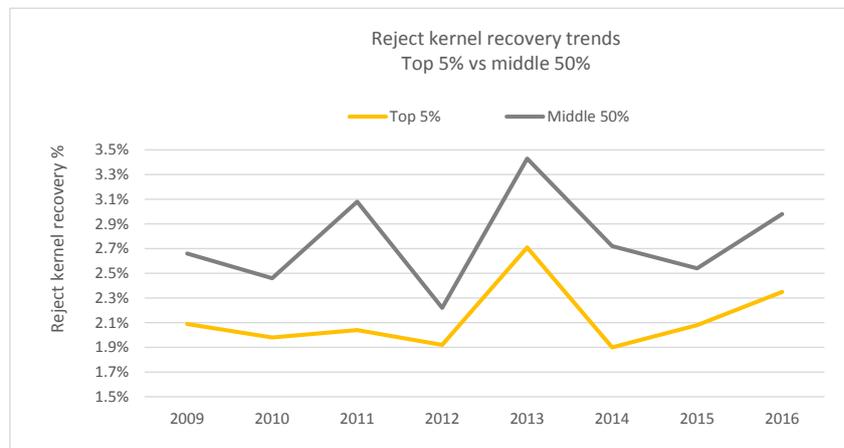


Figure 5. Reject kernel recovery for the top 5% and middle 50%.

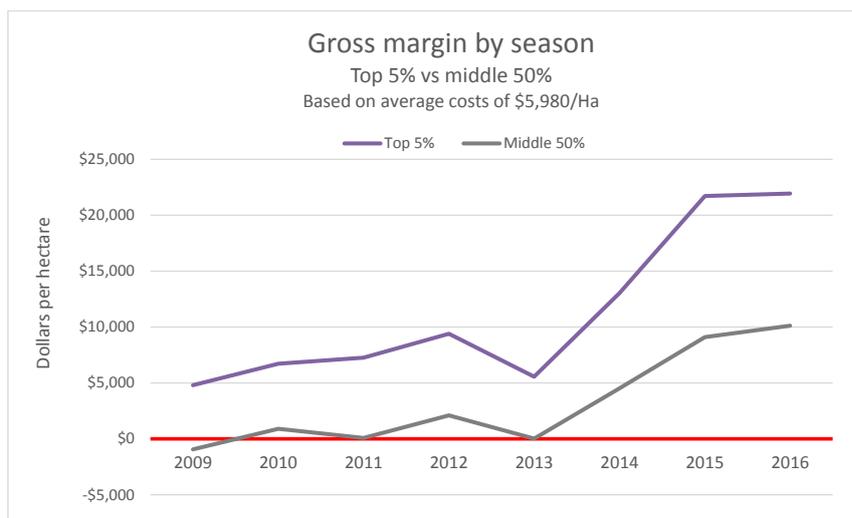


Figure 6. Gross margin for top 5% farms and middle 50% farms.

The macadamia benchmarking project (MC15005) is a joint initiative of the Queensland Department of Agriculture and Fisheries, the University of Southern Queensland and NSW Department of Primary Industries, with support from the Australian Macadamia Society. The project has been funded by Horticulture Innovation Australia Limited using the macadamia levy and funds from the Australian Government. The Queensland Government has also co-funded the project through the Department of Agriculture and Fisheries.

at specific farm management practices and their impact on productivity. The benchmarking team is also investigating collection of additional agronomic and

economic data to provide further understanding of the drivers of high farm productivity.

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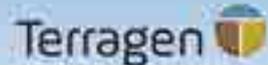
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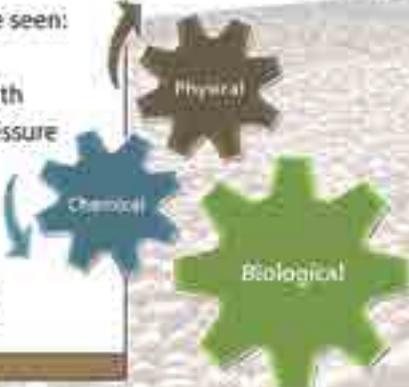
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TAX AND FARM MANAGEMENT DEPOSIT SCHEME

Improvements to the farm management deposit (FMD) scheme give farmers more flexibility in managing their finances, especially during periods of hardship, such as drought or natural disaster. The improvements make FMDs an even more effective tool for farmers when managing their businesses.



There are some basic rules that apply to the FMD scheme you should be aware of:

- you must make the deposit with an FMD provider
- you must be an individual conducting a primary production business (including through partnerships and trusts) when you make the deposit
- the deposit must be on behalf of only one individual
- deposits are deductible in the income year in which you make them, and the minimum deposit or repayment is \$1,000
- the maximum of all deposits you hold at any one time is \$400,000 (before 1 July 2016) and \$800,000 (from 1 July 2016)
- interest on deposits is assessable in the income year in which it is paid
- the deduction allowable in any income year is limited to the taxable income derived from a business of primary production in that year
- you can hold FMDs with more than one FMD provider
- you can't claim a deduction for any amount that exceeds the maximum deposit cap or if your taxable non-primary production income is more than \$100,000

- trustees can only make deposits on behalf of a beneficiary presently entitled to a share of the income of the trust estate who is under a legal disability, e.g. a minor
- deposits by two or more people jointly or made on behalf of two or more people are not recognised as FMDs.

Natural disasters

If you are affected by a natural disaster, you can access your FMDs within 12 months of making those deposits, without having to cancel your tax deduction. However, you will need to include the deposit as assessable income in the year you withdraw it.

To be eligible, you must hold a farm management deposit and meet all the following requirements. You must:

- have made a deposit before the relevant natural disaster
- have received assistance through a primary producer Category C recovery grant under the Natural Disaster Relief and Recovery Arrangements (NDRRA)
- withdraw your deposit after the recovery assistance was first provided (but within 12 months of making the deposit).

Severe drought

If your primary production property is experiencing severe drought, you can access your FMDs within 12 months of making those deposits, without having to cancel your tax deduction. However, the deposit will need to be included as assessable income in the year you withdraw it.

To be eligible, you must hold a FMD and meet all the following requirements. You must:

- have made a deposit in the previous income year
- have held the deposit for at least six months
- be able to demonstrate an area of your primary production property has been affected by rainfall for that six-month period within the lowest 5% of recorded rainfall for the property
- not be involved solely in primary production industries like fishing, pearling, tree felling or tree transporting.

You can determine if your primary production property meets the rainfall test at a particular time by using the FMD rainfall analyser on the Bureau of Meteorology website. We will accept a printed report from this tool as evidence of your property's FMD rainfall status at that time.

Find out more

Detailed information about tax and the FMD scheme is available at:
www.ato.gov.au/farmmanagementdeposits

Acknowledgment. This article was provided by the Australian Taxation Office.

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BUSINESS

Are you adequately covered if disaster strikes?

Do you have enough insurance? If you suffered a total loss — if a fire came through and destroyed your sheds, fences, equipment, crops, livestock and your home — would you have enough coverage to start over? Many of us don't carry enough insurance. We think 'it won't happen to me'. But what if it does happen?

Here are our top tips to make sure you've got enough insurance coverage.



Do a risk assessment

Often you don't know how much insurance you really need until it's too late. The best precaution is to undertake a risk assessment of your property. Consider the replacement cost of items used in the farm business. Contact your insurance company to send in a representative.



Could I cope?

When deciding to insure an item, ask yourself whether you could run your business without it if it were damaged or lost. If not, could you afford to replace it without the assistance of an insurer?



Out in the paddock

All too often fencing is insured for a low amount as a total loss seems unlikely, leaving farmers short in the event of a major incident. Don't underestimate the value of your crops, hay and livestock. Insure your silos properly, too.



Act quickly

Don't forget to add new vehicles, machinery and equipment to your policy straightaway. It's not just big items like a new harvester or tractor, add the smaller items, like a new quad bike, too.



Extend your liability

Consider getting an extension to your Farm Legal Liability when either buying or leasing additional farming properties.



Don't underinsure your farm equipment and infrastructure as this can leave you short in the event of a major incident.



Loss of income

In the event a major disaster strikes and your farm is unworkable, loss of income insurance can help ensure you still have money coming in until you get things up and running again.



Build a relationship

Your insurance company is there to help. You can change or update your policies at any time, so build a relationship with them where you can give them a quick call (or even send them a text with a photo of your new purchase) to make sure you're covered.



Don't wait until it's too late

Many people only look closely at their insurance policies when they need to make a claim. It's up to you to make sure you have all the coverage you need, so don't wait until it's too late!

To review your insurance cover, contact your insurer.

Acknowledgment. Article supplied by WFI



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CLOCK IS TICKING – MAXIMISE YOUR SUPER CONTRIBUTIONS

Megan Diamond, AustSafe Super

Changes to contribution limits passed through both houses of Parliament on Wednesday 23 November 2016 as part of the Federal Government’s superannuation reforms. These changes are targeted at making the superannuation system more sustainable for all Australians.

From 1 July 2017, after-tax (non-concessional) contributions will be limited to \$100,000 a year for people under 65 years of age, reduced from the current \$180,000 limit, or \$300,000 over three years, reduced from the current \$540,000 limit.

It’s a considerable reduction to the after-tax contribution caps, but there is still time to take advantage of the current legislated contribution caps and contribute up to \$540,000 for the 2016-17 financial year. Known as the bring-forward rule, if you’re under the age of 65 at 1 July and have not used the bring-forward rule in the previous two financial years, you can still do so before 30 June 2017.

Your after-tax contributions are contributions you can make into your super fund once tax has been paid on them. These include:

- Personal contributions – made by you personally on which no tax deduction is claimed.
- Spouse contributions – contributions made by your spouse to your fund on your behalf.
- Excess contributions – contributions you have not elected to release from your super fund.

From 1 July 2017, before-tax (concessional) contributions will be limited to \$25,000 a year for anyone of any age, reduced from the current \$30,000 limit or \$35,000 limit if you are 49 and over.

Again, there’s still time to take advantage of the current legislated caps and contribute up to \$35,000 if you are over 49, or \$30,000 if you are under, as long as you do so before 30 June 2017.

Your before-tax contributions are contributions made into your super fund before tax has been paid. These primarily include:

- Employer contributions including salary sacrifice payments
- Contributions allowed as an income tax deduction.

If you think you’re in a position to take advantage of current before-tax and after-tax caps, it’s important to seek advice to ensure it aligns with your current retirement planning strategy.



Information

Megan Diamond
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Biochar conference comes to Murwillumbah

In January this year, the Colorado General assembly passed a bill to support the United States Forest Service and the Agricultural Research Service of the United States Department of Agriculture in researching biochar.

The research examines the removal of fuel loads on the forest floor for the creation of biochar and the use of biochar as a soil amendment for reforestation, the continued creation of biochar from woody biomass found in our forests, and the use of biochar as a soil amendment in our forests and farms, towns and cities to assist with reforestation treatments.

The bill will promote confidence among Australian and New Zealand foresters who are looking to eliminate fuel on the forest floor and create bio-products from offcuts and debris that normally have no commercial value using pyrolysis technology.

Interested in biochar?

The Australia New Zealand Biochar Conference (ANZBC17) is the ideal place to find out more.

The conference will showcase the latest pyrolysis technologies from around the world to match the corresponding biomass source. The event is designed for foresters to attend, exhibit and sponsor.

When: 10 to 12 August 2017

Where: Murwillumbah Civic and Cultural Centre and Showgrounds.

Information and registration: anzbc.org.au



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ANZBC17**

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nutrients in the soil**

**Consistency in tree health;
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Advertise with us

Would you like direct access to the people who own and run businesses in the macadamia industry? Would you like your product or service showcased to 90% of macadamia growers and industry representatives across Australia? Then consider advertising in the macadamia industry's No1 publication – the *Australian Macadamia Society News Bulletin* - **TODAY**.

Renowned for its content, relevance and farmer likeability, the *AMS News Bulletin* has been the most up-to-date, reputable and valued source of macadamia industry news for more than 30 years. The quality and variety of content means that this magazine is kept as a technical resource for future reference, giving advertisers unparalleled shelf life. This quality publication is mailed to all Australian Macadamia Society members (over 700 growers, processors and other industry stakeholders) every three months, guaranteeing that your message hits the mark every time.

To book your ad today, or to obtain our advertising kit, phone Tamara Hepburn at the Australian Macadamia Society on 1800 262 426 (Australia only) or +61 2 6622 4933 or email tamara.hepburn@macadamias.org

Key facts

Circulation: Distributed nationally to more than 700 growers and industry members

Readership: 2000

Frequency: Quarterly

We know we're hitting the mark with our content because our 2012 reader survey found that:

- 90% of AMS members read the *AMS News Bulletin* magazine
- 75% of AMS members name the *AMS News Bulletin* magazine as their main source of information about the macadamia industry
- 70% of readers retain their edition indefinitely for future reference
- 60% of readers share their copy with at least 2 other people.

Why advertise?

Operators in the macadamia industry make major buying decisions every day. Whether your business is selling tractors, harvesters, dehusking equipment, farm management and consulting services, heavy equipment, real estate, irrigation supplies, motor vehicles, chemicals or fertilisers, there is no better way to reach this important group of buying prospects than by placing your sales message in the *AMS News Bulletin* magazine.

- The *AMS News Bulletin* is the most highly regarded industry publication and is well established as an authoritative source of insight into and analysis of the Australian macadamia industry.
- We give you direct access to the people who own and run businesses in the macadamia industry.
- Where better to promote your products and services than the industry's 'must-have' magazine? Here's the perfect opportunity to increase exposure and awareness of your products and services to a highly targeted market.





A MEMBER OF WARING GROUP
Australia • USA • Vietnam • China

It's **GOOD** to be *Different*

Our experienced team at MWT Foods is dedicated to providing the very best on and off farm services, ensuring that growers can focus on harvesting their crops with confidence and security in regards to:

- Supply and Transport of Skip Bins for harvesting
- Efficient, Safe and Cost Effective de-husking, sorting of NIH / NIS
- Quick and Reliable NIS pick-ups ex farm and receivals into our facilities

Our grower focused programs, deliver RELIABILITY, TRANSPARENCY, FAIRNESS, TIMELINESS and ACCURACY, in terms of all things that determine the value of a batch and crop.

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 gellis@mwtfoods.com chriswaring@mwtfoods.com
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 www.mwtfoods.com



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MERV
(TRANSPORT CO-ORDINATOR)



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