

In A Nutshell

Autumn 2017

guest article
Water...
your **profit enabler**

**Varroa
Eradication**

Emergency Plant Pest Response
Levy to be activated following
consultation period

SNAP!
wet **Spring** creates
potential mouse plague
CSIRO warns



green light for our
experimental orchard

60ha block to become **world-leading
research site** for almonds

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FOR FURTHER INFORMATION, CONTACT YOUR HAIFA TEAM

Trevor Dennis, Managing Director
E: trevor.dennis@haifa-group.com

M: 0400 119 852

Shaul Gilan, Senior Agronomist
E: shaul.gilan@haifa-group.com

M: 0419 675 503

Peter Anderson, Qld Sales Agronomist
E: peter.anderson@haifa-group.com

M: 0459 488 850

Jon Corona, Regional Agronomist, Mildura
E: jon.corona@haifa-group.com

M: 0408 568 605

Jason Teng, Customer Service/Logistics
E: jason.teng@haifa-group.com

M: 0488 036 528



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Pioneering the Future



In A Nutshell

The Official Newsletter of the Australian Almond Industry



Executive Update

4



60 hectare block to become world-leading research site

5



SNAP!

Wet spring creates potential mouse plague

11



5 minutes with...

Renée Morelli from Riverland Almonds

14



Water

Your profit enabler

17



Varroa Eradication

EPPR Levy to be activated

19



Managing Carpophilus in Almonds

2017 Guidelines

23

On the Cover:

Ross Skinner (Chief Executive Officer, Almond Board of Australia), Daniel Casement (Executive Director, Rural Solutions SA, PIRSA), Scott Ashby (Chief Executive, PIRSA), and Brendan Sidhu (Almond Centre of Excellence chairman)

In A Nutshell

Published by: The Almond Board of Australia
Editor: Jo Pippas, Conference & Communications Manager
jpippas@australionalmonds.com.au

The Almond Board of Australia is the peak industry body representing the interest of almond growers, processors and marketers in Australia. In A Nutshell is published by the ABA to bring news to all industry contacts and members.

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Almond Board of Australia Inc, ABN 31 709 079 099
1801 Bookpurnong Road , PO Box 1507, LOXTON SA 5333
t +61 8 8584 7053 e admin@australionalmonds.com.au w www.australionalmonds.com.au





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ALMOND BOARD OF AUSTRALIA

ABA Membership Why become a member?

The ABA is the peak representative body for the Australian almond industry and as such addresses many issues that impact on all participants in the industry including growers, processors and marketers and those that supply inputs. These impacts can be positives such as free trade agreements or promotion to stimulate demand and hence prices or they can involve minimising negative situations such as food safety issues, market access problems, chemical registrations etc.

The ABA develops and drives the implementation of the Australian industry's strategic plan which is done to benefit all producers and other industry participants. The strategies involve building domestic and export markets, the key to strong grower returns, addressing a wide range of risks from the availability of production inputs to government policies that impact on costs and yields. These matters effect on the bottom lines of almond enterprises. The ABA's whole of industry strategies have been successful and have worked to ensure the large increases in production have been cleared.

The ABA operates a number of activities that support industry and generate revenue to fund its operations and keep membership fees at a low and affordable cost. Being an ABA member provides crucial support for your industry body that we need and appreciate. A strong membership base provides added force in our representation of industry to government and in the wider community.

Join the ABA today, in the knowledge you are assisting the industry and yourself to move forward as Australia's most valuable horticultural industry.

Join the ABA by visiting our website, phoning 08 8584 7053 or emailing admin@australianalmonds.com.au

Executive Update

With harvest now underway it has been a growing season like few others. The mild weather has delayed crop maturity and drastically reduced irrigation water requirements. It appears to have delivered a record tonnage in 2017 and produced buds for the 2018 crop that look to have the potential of a very large crop.

The latest tonnage estimate for 2017 is around 87,000 tonnes, up nearly 10% on the 2016 figure. The market is much stronger currently than at the same time last year, when it was impacted by the rapid rise and fall of prices in 2015/16.

Record US export shipments during the past year give reason for optimism about the global almond market. The US started their marketing year in August with 9.4% more old crop in storage than the previous year and 2016 crop receipts are running 12.6% ahead of those in 2015. This equates to a significant rise in available US supply, but this increase has been well and truly exceeded by the 33.4% increase in total US shipments with strong growth in exports (43.2%) and their domestic market (15.1%). Commitments of product sold but not yet delivered are also running 10.2% ahead of figures reported for January 2016.

The situation for Australia's 2016/17 marketing year (March to February) does not match the US achievements, but that is to be expected given the smaller crop produced in 2016 compared to the record tonnage of 2015.

The domestic market continues to consume almonds in ever increasing volumes, with year to date consumption up by 6.76% to 19,854 tonnes. Exports for the same period have declined from 56,321 tonnes to 52,779 tonnes. The overall position reflects that you cannot sell what you haven't produced or held as carry-in to the new season.

Australia has long been known for its droughts and flooding rains but California is getting in on the act. After suffering four years of severe drought the dry spell has been broken with a deluge reminiscent of our 2011 storms that filled near empty water storages in a single year. Their heavy snow pack and rain has swollen rivers and refilled dams to the point of bursting, with the USA's tallest dam at Oroville spilling over, leading to the evacuation of 200,000 people in its downstream path.

Flooded rivers in southern California have also brought tragic loss of life as has been the recent experience in Australia's north where flooding rains have exacted a toll.

Although the Californian drought has broken, the Australian experience is that orchards take a while to fully recover, and that rain during the pollination period will not assist in improving yields. Managing such risks to production is part and parcel of farming and as we commence the delayed 2017 harvest it is to be hoped that the rain stays away and a dry harvest is experienced to enable a record tonnage to be gathered.



Neale Bennett, Chairman

Neale Bennett



Ross Skinner, CEO

Ross Skinner



60 hectare block to become world-leading research site

Land for the Australian almond industry's major experimental orchard has been secured at Loxton by the South Australian government and arrangements for the Almond Board of Australia (ABA) to lease the property are part of an agreement reached in 2015.

The idea of developing a Centre of Excellence for the Australian almond industry has been worked on by the ABA since 2013. Originally, the concept for the orchard site was to have the ABA head office and an experimental orchard for almond research projects located together. However, the \$7.5 million redevelopment of the Loxton Research Centre by the South Australian government provided the ABA and other organisations with refurbished, laboratory areas, meeting and conference facilities.

Major factors driving the ABA to develop the experimental orchard concept were: the significant increase in the almond R&D program from \$1 million to \$4 million per annum over the past ten years and its continuing growth as the industry expands further; the increasing involvement of the ABA in developing and monitoring projects; the need to engage more closely with research organisations; and the difficulties in undertaking research on grower properties when trials impact heavily on normal commercial practices.

The industry understands the need to improve production systems to reduce risks posed by inclement weather during harvest, and also the difficulties posed in managing large trees from a pruning, harvesting and pest and disease management perspective.

New varieties bred by the University of Adelaide combined with size limiting rootstocks from Spain and the US offer the potential for new production systems based around smaller trees grown at higher densities.

The aim is to produce orchards that have higher yields, allow shake and catch style harvesting and controlled dehydration, thus achieving a very consistent product that processes more efficiently and results in a very high quality product.

The support of the South Australian government extends to providing funds to both develop the experimental orchard and support up to five researchers.

The Victorian government has also been very supportive of the industry and has committed to developing and managing a trial orchard at its 25 hectare research facility near the Sunraysia Horticultural Research Institute, as well as supporting the employment of additional researchers. Research at the Mildura facility will focus on enhancing the quality of almond crops, while also helping to minimise pest and disease damage to meet export standards for residues and food safety tolerances.

The funding of the South Australian and Victorian governments has, in part, been matched by funds from the Commonwealth government in the \$10 million project "Advanced Production Systems for Temperate Nut Crops". This project prepared collaboratively by researchers and the ABA and submitted by Horticulture Innovation Australia Ltd has added significant research capacity to the almond industry.

The ability of both the state governments and their departments to work together at a Ministerial, Executive and research level has been instrumental in the industry securing the research facilities in both the Riverland and Sunraysia.

Research trials envisaged for the experimental orchards cover: improving soils to enhance water use efficiency and tree nutrition; new variety evaluation; input optimisation for existing orchards; enhanced pollination; climate change adaptation; and new production systems including harvesting equipment and postharvest handling and storage.

An important aspect of developing the experimental orchards is to involve experienced researchers from Australia and overseas to develop young researchers so as to provide the Australian almond industry with a strong research capacity for the future.



[Click to watch the video](#)



Australian Government



Government of South Australia

A jewel for the Riverland's crown



The Loxton Research Centre recently underwent a \$7.5 million redevelopment, funded as part of the \$265 million Australian Government-funded South Australian River Murray Sustainability (SARMS) Program.

The 33 hectare site will continue to build on a proud 50-year legacy of groundbreaking irrigation and horticulture research and extension – with a renewed focus on driving innovation through collaboration and partnerships.

More world-class agricultural research can take place at the Loxton Research Centre, helping to boost yields and create jobs, with the official opening of the upgraded state-of-the-art agriculture hub.

The Centre will become a key regional location for national and international research and events, attracting delegations, businesses and their investment to the region.

The new building includes a state-of-the-art conference centre, seating up to 200 people. This multi-function conference room includes high-speed internet and wi-fi, and can convert into two boardroom-sized business function rooms that open onto a deck, overlooking an established walnut orchard.

At the heart of the new building design is the demonstration kitchen (pictured above left). The specially designed

kitchen will be available for celebrity chefs and the region's premium food and wine producers to promote their produce and host special tastings, as well as support catering for conferences and business meetings.

Flexible working spaces provide a contemporary, relaxed working environment designed to support collaboration, as well as for visiting businesses and delegations.

Minister for Regional Development Fiona Nash said the redeveloped hub encourages researchers and industry to drive research and innovation in agriculture.

"As a farmer from a regional area, I know how important development and research in agriculture is," Minister Nash said.

"We export to markets all over the world and the race to be more efficient and produce more with each piece of land and water is never-ending.

"This investment supports ongoing research and the demonstration kitchen will help the region to showcase its great produce."

Federal Member for Barker Tony Pasin, who joined the Loxton community for the official opening, said the project was funded under the \$265 million South Australian River Murray Sustainability (SARMS) Program.

"The Loxton Research Centre has been at the forefront of agricultural research for more than 50 years," Mr Pasin said.

"The Centre champions world class research in various fields such as irrigation, horticulture, soil science and agribusiness.

"I am excited about the wonderful opportunities that have opened up to local industry from the Australian Government's investment. This project will support the future of sustainable agriculture in the Riverland."

South Australian Premier Jay Weatherill said the Loxton Research Centre has a strong and proud history of agricultural research and innovation that has benefited farmers across the globe.

"I am delighted to be here today to herald the next chapter of this important facility.

"This redevelopment will foster a new era of innovation and collaboration and grow our State's global reputation as a leader in sustainable agriculture and a producer of premium food and wine in a clean, green environment," Mr Weatherill said.

"To support this the State has invested heavily in industry leadership, notably with the establishment of the Centre of Excellence for the Australian Almond Industry here at the Loxton Research Centre."

South Australian Minister for Regional Development Geoff Brock said that almost 12 months ago to the day he helped turn the first sod for this redevelopment, and it is with a great sense of pride that he was able to celebrate the opening.

"With its stunning design and modern technology, this world-class facility constructed by local builders will attract new business, research and investment into the region and will provide huge benefits for many years to come. It's a shining example of the vital role South Australia's regions are playing in economic growth and job creation," Mr Brock said.

The Coalition Government provided funding of \$7.5 million through the South Australian River Murray Sustainability (SARMS) Program to Primary Industries and Regions SA (PIRSA) to deliver the Loxton Research Centre redevelopment.



[Click to watch the video](#)

Hard Nuts

**Australian Almonds partner with
AFL Players Association**



A key component of the 2017 Australian almond consumer marketing program will be our partnership with the AFL Players Association. Five AFL ambassadors will appear across a number of videos, recipe cards and photos that will be featured each month from March to June, 2017.

PR agency – Mango Communications has been engaged to help develop and implement a comprehensive public relations program.

One of the major themes to create consumer engagement across both the Australian Almond and the AFL Players Association's social media platforms will be the introduction of our Australian Almonds 'Hard Nut' Award. Each month our AFL ambassadors will nominate their 'Hard Nut' to launch the month's competition.

A special micro-website will be built to enable consumers to participate in the competition by identifying their favourite 'Hard Nut' a local sports person, or a nationally known personality.

The first set of videos were filmed during February, featuring our two AFLW players, Brianna Davey from the Carlton Football Club and Ellie Blackburn from the Western Bulldogs Football Club. Some great coverage of the initiative was received, with The Herald Sun in Melbourne attending the filming.



Liam Picken, Western Bulldogs Football Club



Ellie Blackburn, Western Bulldogs Football Club



Max Gawn, Melbourne Football Club



Brianna Davey, Carlton Football Club



Scott Selwood, Geelong Football Club

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This article was featured in the Melbourne Herald Sun's printed paper and syndicated across a number of News Corp's news sites and papers including:

- Herald Sun (Melbourne)
- The Daily Telegraph (Melbourne)
- The Advertiser (Adelaide)
- The Courier Mail (Brisbane)
- Perth Now
- The Mercury (Hobart)
- Gold Coast Bulletin
- Geelong Advertiser

Circulation of this article was just under one million.

Our partnership program with the AFL Players Association and our Australian Almond 'Hard Nut' competition was launched in the lead up to the match between Carlton and Western Bulldogs on March 4th.



Marketing Matters

Global health and nutrition news

In December 2016, the results of a joint study by the Almond Board of California and the USDA were published highlighting that both roasted and unroasted almonds provide fewer calories than thought—and that the number of calories is largely dependent on form¹

The researchers found that whole unroasted almonds provided 25% fewer calories than expected, while whole roasted almonds provided 19% fewer calories. Chopped roasted almonds provided 17% fewer calories, though the difference between the calories absorbed from chopped and whole roasted almonds was not statistically different. Measured calories in almond butter did not differ from calories estimated using Atwater factors which is the current method of calculating our Nutrition Information Panel information.

One of the explanations for the calorie difference between almond forms relates to particle size after chewing and digestion. The larger the particle size, after chewing for example, the less the almond is able to be broken down by digestive enzymes and more of the almond is excreted, so fewer calories are absorbed. The reverse is also true: the smaller the particle size, the more almond cells are exposed to digestive enzymes and the more calories are absorbed. In addition to chewing and digestion, mechanical processes, such as chopping, grinding and roasting almonds can also impact particle size.

The importance of this study lies with explaining to consumers around the world that almonds are not as calorific as many perceive. Communicating the findings of these types of studies helps to counter some misconceptions held by consumers wanting to manage or lose weight.

¹Gebauer SK, Novotny JA, Bornhorst GM and Baer DJ. Food processing and structure impact the metabolizable energy of almonds. Food & Function. 2016;7(10):4231-4238.

Global supply & demand

The January Position Report by the Almond Board of California indicates strong global demand for almonds during their current crop year to date (August 2016 to January 2017). While California's total supply has grown by 12% to 2.478 billion pounds (including both Carry-In and Crop Receipts), total shipments have increased by 33.4%. These shipment results include domestic sales growth of 15% and export sales growth of 43%.

Nut Category	2016	2015
Almonds	9,035	9,119
Cashews	3,363	3,054
Hazelnuts	5,683	6,249
Macadamias	537	521
Walnuts	1,792	1,648
Pistachios	953	959
Peanuts	6,123	5,714

Global Product Launches

During the 2016 calendar year, almonds remained the number one nut used as an ingredient in new products launched globally. This includes all tree nuts and peanuts.

More than 9,000 new products were launched globally in 2016 that featured almonds as an ingredient. This compares to 6,123 products with peanuts and 5,683 with hazelnuts.

This is a very strong result for the global almond industry considering the price volatility over the past couple of years.

Almonds remain the #1 nut as an ingredient in new products launched GLOBALLY in the last 12 months.

Export Program

Established market program



February: Gulfoods, Dubai, UAE

February 26 to March 2 - This is a key exhibition attracting our customers from India as well as the Middle East and Africa.



October: Anuga, Cologne, Germany

From October 7 to 11 in Cologne. One of the world's largest food exhibitions, held every two years. Europe is our largest export region accounting for 37% of total Australian almond export sales.

Emerging market program

FOODEX JAPAN 2017

March: Foodex, Tokyo, Japan



April: Food & Hotel Indonesia, Jakarta, Indonesia



May: SIAL China, Shanghai, China



September: Asia Fruit Logistica, Hong Kong, China



WHAT'S NEW IN NUTS?

At Stoller Australia we know nuts. Stoller's global network captures the latest nut research from around the world and we've been testing our programs in Australian almonds for almost 20 years.

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SNAP!

Wet spring creates potential mouse plague, CSIRO warns



Within the last month the CSIRO have released a warning for farming regions in South Australia and Victoria. The wet spring, in conjunction with the mild summer, has created optimal conditions for feed production and breeding for the common house mice. Subsequently, since one breeding pair of mice can produce 500 mice within 21 weeks, the survival rate of these juveniles determines the level of populations and resultant damage we will see to crops and property.

For effective control and highest chance of eliminating the pest throughout the almond industry, strategies must be followed and well planned by each contributor of the production chain; from the orchard to the processor. Control is to be achieved through denying entrance into facilities, minimising nesting and breeding locations, and culling if invasion occurs.

A fact sheet outlining the importance of managing the incidence of the pest was released and sent to all growers. The importance of implementing thorough whole of industry management practices will contribute to controlling the population levels.

The house mouse can cause substantial damage in both the processing plant and in the orchard. High levels of damage were incurred after the 2010 season where similar conditions were experienced. Mice cause the most significant damage in processing and storage areas of almond facilities, however, they can damage the crop from flowering onwards.

While the primary method of damage is eating, contamination of the product can have serious food safety ramifications. Mouse plagues can also damage more than just the almond. Damage can also include degradation of storage facilities and adverse customer relations due to lack of confidence in the industry's ability to control and provide a clean, quality product. As a consequence of contamination of the product, disease outbreak can occur. This can be through direct contact with faecal matter, urine, dead animals, saliva (through biting), as well as inhalation of contaminated particles (eg disturbance of dust). Bacterial diseases that the mouse can pass on to the consumers and workers include: Salmonellosis (*Salmonella typhimurium*) through consumption of faeces and leptospirosis (*Leptospira interrogans*) through infected urine.

With the importance of eradicating salmonella in the orchard and in processing facilities being of high importance, the control of mice is critical with regular testing required to gauge the effectiveness of the management program implemented.

One aspect of the management strategy is through poisoning of the mice. There are different types of methods and products through the extermination process. However, depending on the situation, the common poison bait station may not always be the best method available as the bait can take a few days to cause death.

There are two categories for rodenticides available: Acute and Chronic. Acute

rodenticides are fast acting and include strychnine and zinc phosphide. With these products, death usually occurs within 20 minutes to 24 hours after ingestion. These products are to be used with caution as they can induce strong 'bait shyness' because of the short time between sickness and death. Furthermore, zinc phosphide is not registered for use in bait stations located near buildings or storage sheds. Chronic rodenticides, such as Warfarin, are slow acting anticoagulants. This product requires multiple feeds and can take up to 10 days to induce death. An alternative product, Brodifacoum, requires only a single feed and can cause death within 3-7 days.

While poisoning has its place, high levels of orchard hygiene targeting the removal of food sources and cleanliness/organisation of sheds and machinery helping to minimise nesting options will provide a solid foundation in minimising the impact of a plague this coming season.

More information can be found on the ABA's ['All About Almonds' fact sheet - Managing Mice in Australian almonds.](#) (click to follow link)



Almond Industry Levy Snapshot

See your levy in action!

Hortlink is Horticulture Innovation Australia's quarterly publication delivering a detailed overview of your levy at work. The latest edition (2017, edition 1) is out now and packed with essential, easy-to-read info for growers, including...

- Details of new, ongoing and recently completed R&D projects for each levy industry
- Results and resources that can be used in growers' businesses
- Updates on industry marketing activity and results
- Case studies featuring growers, researchers and more.

Check it out at www.horticulture.com.au/hortlink-2017-edition-1. And if you're not already a member of Hort Innovation, remember that signing up is free and easy at www.horticulture.com.au/membership.

Management of *Carpophilus* beetle in almonds (AL15004)

Status: Ongoing project

What's it all about? This project was established in 2016 in response to industry concern about the impact and management of *Carpophilus* beetles in almond production, after confirmation that the beetles were present in almost 70 per cent of almond plantings. The project aims to develop a cost-effective management system to control the pest, without increasing secondary pest issues.

It is:

- Investigating the potential of the *Carpophilus* Attract & Kill system for use in almonds (currently used in stone-fruit orchards)
- Developing understanding of the biology, ecology and distribution of *Carpophilus* species in almonds
- Screening candidate pesticides.

What's the latest update? The project is currently using a 420-hectare almond orchard with a history of *Carpophilus* to investigate population distribution, estimate the active radius of traps, and to determine the optimum number of traps required to monitor population levels.

Work in the laboratory has also begun to study the effect of pesticides on *Carpophilus* mortality. Initial results have been generated for insecticide Cormoran – but at the time of reporting to Hort Innovation, the researchers noted seasonal conditions had restricted access to sufficient beetle populations to establish large laboratory colonies for replicating the tests. Further testing is needed.

The project has also produced an updated fact sheet, *Managing Carpophilus Beetle: Monitoring and Attract and Kill 2016-17 Season*, which is available from Hort Innovation here.

Better tree performance and water use efficiency through root system resilience (AL13009)

Status: Ongoing project

What's it all about? Established in 2014 and due for completion in 2019, this project is being conducted as part of a coordinated research program into boosting almond productivity and profitability. It specifically aims to support more informed rootstock choice, more efficient irrigation strategies and more efficient use of nutrition.

What's the latest update? 12 rootstocks have been assessed for resilience to soil-water deficit and high soil conductivity (as described in previous editions of Hortlink)

A further eight rootstocks are currently being assessed in glasshouse studies during the 2016/17 growing season

Root function is continuing to be assessed under different irrigation and nutrition regimens at the project's field site. The use of 'minirhizotron tubes' for regular photographic imaging will allow the direct determination of root phenology, growth and turnover, and analysis over time will demonstrate the impact of the water and nitrogen regimens on these factors

As reported in the last edition of Hortlink, sap-flow sensors were installed in-field

in 24 trial trees at the start of the 2016/17 season. These will allow whole-season tree water use to be monitored. In combination with canopy and yield data, the results will allow whole-tree water use efficiency to be determined and linked with irrigation and nutrient treatments, as well as root density and growth.

The December 2016 issue of *Australian Nutgrower* featured articles on this project, including "Better tree performance through root system resilience", which provided a general project overview.

Managing almond production in a variable and changing climate (AL14006)

Status: Ongoing project

What's it all about? Commencing in 2015 and expected to conclude in 2019, this project is conducting a detailed analysis of climate data in order to assess and prioritise key climate risks for the main almond growing regions in Australia. These risks include heat waves, droughts, untimely rainfall and insufficient chilling units of cold weather. The project will also suggest options for managing these risks.

What's the latest update? The project continues to investigate management options for key climate risks, and continues to develop tools for how decisions around these management options can be made by almond businesses.

With rain at harvest previously identified as one of the industry's most important weather and climate risks, recent work in the project has involved creating a framework for making a management decision prior to potential rain – whether to go ahead and

shake, or to delay harvest and leave fruit on the trees – based on cost-benefit risk analysis. Work in this area is ongoing.

The project is also developing a ‘phenology’ model for almonds, detailing the timing of crop development under Australian climatic conditions. Information from this model will be valuable in managing pests and diseases, ensuring high levels of pollination, scheduling harvest and scheduling other business operations.

Finally, the project continues to study trial trees in orchards and pot-based experiments to look at ‘meso-climates’ (the specific climates of particular orchard sites) and tree phenology and physiology. To date, the researchers report that meso-climate differences related to elevation exist between the different field locations, and that the effects of elevation on daily temperatures are unique to each location.

Almond productivity: Tree architecture and development of new growing systems (AL14007)

Status: Ongoing project

What’s it all about? Established in 2014 and due for completion in 2019, this project is being conducted as part of a coordinated research program into boosting almond productivity and profitability. It has a specific focus on tree architecture and the development of new growing systems.

What’s the latest update? At the time of last reporting, project trials had been expanded. After originally beginning with the establishment of trial sites on two separate properties in Lindsay Point, Victoria, in 2014, the expansion involved establishment of a new trial in the Riverina region and two new trials in the Riverland region. A further trial planting was also set to take place near Hillston, New South Wales.

The Riverina and Riverland trials were to look at new growing systems for new varieties, with the objective of quantifying growth responses to pruning regimens better suited to high-density planting systems.

At the time of last reporting, trial plans had also been agreed – and plant material ordered from nurseries – for new projects to be established in winter 2017. With the project progressing, new trial plots are set to look at optimised trunk girdling, high-density orchards optimised for new varieties and rootstocks, and more.

Advanced processing of almonds (AL12003)

Status: Ongoing project

What’s it all about? This project aims to address some of the industry’s priorities relating to post-harvest processing of almonds. Since kicking off in 2013, in partnership with the University of South Australia, it has evolved to support:

- A PhD student undertaking research into effective aeration and dehydration of bulk almonds in silos, bunkers and sheds
- A post-doc Research Fellow undertaking research into the effective hulling of almonds in-field and during processing, as well as into improved cracking of almonds
- Work into technologies to sense temperatures of almonds and their waste in stockpiles, to yield map almond pick-up in the orchards, to compare methods of storing bulk almonds and to develop almond hulling, cracking and cleaning equipment (through the use of final-year mechanical engineering and electrical engineering students).

What’s the latest update? No new milestone report was due in the period since the last edition of Hortlink (Spring 2016). At the time of last reporting, for aeration and dehydration, one of the students had developed a model for the dehydration of almonds; designed and implemented a series of in-situ sensors for temperature and humidity to develop a closed-loop aeration control system; and had this system installed in the drying shed of a South Australian grower.

The system controls multiple fans to regulate almond dehydration and re-humidification, and was presented at a field day during 2016. A wireless imminent waste stockpile fire warning system had also been designed and demonstrated.

A harvest time ‘decision matrix’ had also been developed to look at the effects of harvesting at different stages of hull split. Work was ongoing here, along with the analysis of samples.

For almond hulling, ongoing work was investigating methods of achieving hulling and cleaning at rates of 100t/hour, with up to 60 per cent of the fruit hulled in a single pass and with less than five per cent creation of loose kernels. The process was presented to industry at grower meetings last year.

Other R&D projects of note...

Australian almond industry innovation and adoption program (AL16001), a new project to help provide technical advice to growers, facilitate the adoption of R&D and identify and develop initiatives to address capacity-building requirements of the industry.

Almond study tour (AL16701), a new project that supports continued relationship building and collaboration with the Californian and Spanish almond industries.



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.



5 minutes with...

Renée Morelli

For our second edition of '5 Minutes with...' I spoke with a young lady from Riverland Almonds, based at their Loxton Factory. Renee is the Technical Officer for the company, ensuring food safety and technical compliance. She is passionate about her job and our industry, and one of those who never shies away from a task.

Renée, what is your exact role at Riverland Almonds, and what does that entail day to day?

I am the technical officer at Riverland Almonds, and my job is to ensure food safety and technical compliance. Day to day I review laboratory results, documents, labels and information for our customers and facilities to ensure compliance.

How long have you been working at Riverland Almonds?

Just over 16 months

What attracted you to the position at Riverland Almonds?

The role at Riverland Almonds interested me as it allows me to combine my science skills as well as my knowledge about compliance requirements.

What were you doing before you came here?

Before I came to Riverland Almonds I was working at UniSA as a Business Operations Officer, looking at compliance for a range of different requirements from competitive grants to Higher Education Research Data Collection (HERDC). My husband and I were moving to the region for family business and I was looking for a job.

“It is hard not to be motivated when talking to someone who expresses their passion when discussing a topic.” - Renee

Did you do or have you done any study that led you to looking for work in this field?

I have a Bachelor of Science with Honors from The University of Adelaide.

What led you to choosing this course of study?

I loved knowing how things work and what the intricate structures of things looked like.

Have you done any further study since then?

I am always looking for opportunities to build my knowledge. Short courses are ideal at the moment while trying to manage work life balance. You can never know enough!

What are the goals you most want to accomplish in your work? Not so much the goals that are in your job description, but the goals you hold personally?

I want to create a technical team that is able to provide value add information not only to our staff but to our customers and the industry. I think that the moment you think you know it all you are lost.

There is always something new to discover or a better way of completing a task. As the American market has been around of a lot longer, we can utilise preexisting knowledge to ensure that we are competitive on the world stage.

Did you have any key mentors or people who deeply influenced who you are, what you believe in and what you're committed to in your work and life? Tell me about them.

My chemistry teacher inspired me back in year 10 to study science and maths. He showed me how an understanding of these disciplines opens up a new way of understanding of how the world works.

In general I find inspiration in most people whom I talk to in my job. Most people are in this business

because they are passionate about it. It is hard not to be motivated when talking to someone who expresses their passion when discussing a topic.

What would you say most motivates you to do what you do?

I strongly believe that we should be supporting and promoting both South Australia but also the Riverland. Being part of a company that promotes the region and provides local employment is something that I take a lot of pride in. South Australia has so much to offer in the way of fresh produce and the Almond industry is proof of this.

What are you most passionate about in your job?

Ensuring that I am a contributing team member. We are not the biggest producer so it is a team effort to produce the best quality almonds. Being an active and engaged team member is crucial for this to be achieved.

What are the key relationships that matter most in your working relationships?

Key relationships with internal staff members and third parties are the key to anyone's success. A good internal team is what can make or break a business. The team is there to support you when things don't quite go to plan.

What do you see as the key sources of support?

Key relationships with growers and the Almond Board [of Australia] are also essential. I do not always get to see what is happening outside Riverland Almonds but by keeping regular contact with these groups I can gain a better understanding of what is happening and what measures are needed to address it.

What are the most difficult or challenging aspects you see facing the almond industry?

The weather is always challenging. The Californian Almond industry who have experienced a drought, is an example on how mother nature can impact the development of the almonds and cost the grower financially. It is a sobering thought to think how much effort can go into getting the soil just right, only to have hail storms come through and destroy crops as has happened to the grape growers in the Riverland region.

I also think it will be challenging for the industry to maintain the high standards given the expected influx of almonds due to new plantings. Although I have no doubt that the Australian quality will remain high, it is a challenge in pre-planning for all producers.

When you think of the future of the almond industry, what gives you a sense of hope?

The new plantings give me a sense of hope as the industry itself is showing the belief. I also believe that the Almond Centre for Excellence is a huge boost for the industry. Having a Centre of Excellence will enable well planned research which will aid all stages of almond production, leading to better quality and yields.

The Australian Almond industry is a very open community with sharing of information which is not often seen in competitive markets. Although we are all competing, information on pest management is provided to all and discussed openly which benefits the entire community.



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*Gavin McMahon - CEO, Central Irrigation Trusts
& Chairman, National Irrigators' Council*

Water is a prime ingredient for the almond industry and in a time of greater environmental awareness, the water debate and reform will continue for many years to come. The almond industry is a major agricultural industry within the Murray Darling Basin and is competing with other commodities, towns, and the environment for the precious resource.

The Murray Darling Basin Plan was enacted in legislation in 2012 and is to be implemented by 2019. As we move through the early stages of 2017, the 2019 full implementation is approaching rapidly and many things need to be accomplished before 2019.

We have recently seen the outcomes of the Northern Basin Review and submissions for response closed in February. The Northern Basin Review was scheduled in the Basin Plan because the science for decisions on which the water recovery was made was determined not to be as robust as the science for the southern basin.

Importantly the Northern Basin Review found that the earlier economic modelling was flawed and that water recovery to date was having a significant impact on communities. In several communities, between 10-21% of employment had been lost because of water recovery and full implementation of the Plan could see reductions as high as 35% in some areas. The MDBA recommended that the water recovery in the Northern Basin be reduced by 70 GL from 390 GL to 320 GL.

The Basin Plan was sold to our communities as having minimal socio-economic impacts on our communities; a fact many of us disputed. It is refreshing to see the MDBA questioning their modelling, re-evaluating their outcomes

and determining more pragmatic outcomes. I would like to thank MBDA Chair and CEO, Neil Andrew and Phillip Glyde for the empathy and respect they have shown our communities.

The National Irrigators' Council has also been insistent that any changes made in the Northern Basin should not result in increased recoveries in the Southern Basin. The MDBA has given such assurances stating that the changes to the Northern recovery targets would have insignificant impacts in the south.

Since the release of the Northern Basin Review we have seen the NSW and Victorian governments undertaking their own economic studies to determine the validity of the initial MDBA economic modelling; a step welcomed by many.

The next major outcome to be decided is the SDL Adjustment mechanism. This is where the 2750 GL of water recovery could be reduced, if projects that could provide similar environmental outcomes with less water were identified and accepted. During the formation of the Basin Plan it was identified that there could be up to 650 GL of offsets. A sample of such projects includes: South East Flows Restoration Project in South Australia, Nyah Floodplain Management Project on the Murray, Modernising Supply Systems for Effluent Creeks in the Murrumbidgee and the 2011 Snowy Water Licence Schedule 4 Amendments to River Murray Increased Flows Call Out Provisions.

The Project Description, listed on the MDBA website, of the Snowy Project is an example of how environmental outcomes can be achieved. *"Amendments to Snowy Hydro licence in 2011 allow the water recovered by the Murray River Increased Flows to be held and called out. Previously the release of the water was at the discretion of Snowy Hydro and was*

Continued overleaf



generally at times suited to Snowy Hydro's commercial outcomes. The proposal intends to provide a means to control the timing of RMIF water releases from the Snowy Scheme, allowing more flexibility to achieve environmental outcomes targeted in the River Murray below Lake Hume."

Many projects have now being submitted to the MDBA by the State Governments for assessment and the volume of offsets will be determined later in 2017. National Irrigators' Council have been very vocal, that the expectation of our irrigation communities is that the full 650 GL of offsets will be achieved and we believe that the MDBA are working towards that target.

If you combine the 650 GL of offsets with the savings from the Northern Basin Review and the amount of water already recovered, there will be very little recovery required to complete the commitments of the Basin Plan. This is a fantastic accomplishment by all involved to achieve the outcomes of the basin plan. However, it does mean there is approximately 2,000 less GL of water in the consumptive pool and this will impact on all irrigators.

The final piece of the jigsaw is not part of the Basin Plan but a separate Bill that was passed through the Commonwealth Parliament at the same time as the Basin Plan. It is a bill to appropriate \$1.7 Billion for securing 450 GL of extra water from the Murray Darling Basin in a social and economically neutral way, as well as removing constraints to environmental flows in the River Systems. This is commonly referred to as the up-water and is currently being hotly debated in Federal Politics. If the full 450 GL is recovered from the consumptive pool it will have massive impacts on all of our industries. This has communities on edge as we all understand that water is the economic driver of our industries, towns and economies. National Irrigators' Council continues to advocate that we need to find innovative ways to recover this water without damaging our communities economically and socially.

So, what does this mean to our industries and the almond industry particularly? There is no doubt that less water in the consumptive pool will produce a smaller agricultural footprint across the Murray Darling Basin. This is already occurring and the dairy industry has borne the

brunt of the adjustment to date, with milk production not recovering to pre-drought levels.

If the almond industry wants to continue to expand it will be at the expense of other industries and this is market forces in action. However, if the almond industry experiences a down turn and other commodities improve, it may be vulnerable in securing the water it requires for its production.

We have also been very fortunate that since the water recovery began in earnest, we have had two very wet years, 2011 and 2016, and have not gone through a dry sequence of years. The next dry sequence will see greater competition for water than we saw during the Millennium Drought, as there is less water in the consumptive pool available for use and there is significantly more area of perennial crops that will be competing for the water.

So water is a very precious commodity and we should ensure that we are maximising every drop. All growers should understand the water risk profile in their business and ensure they have strategies to manage this during dry times.

The Almond Board of Australia is a financial member of the National Irrigators Council



L&T Nursery – Supplying the Almond Industry with Quality Nursery Trees

Located within the irrigation district surrounding Robinvale, Victoria, L&T Nursery is a quality producer supplying growers in the area and across NSW and SA with almond trees. With over 20 years of experience in the almond sector and 30 years at a primary production level, L&T Nursery has a well-grounded understanding of how the industry operates. The company has a strong commitment to expanding the production of Australian almonds through the production and distribution of quality young trees.

The University of Adelaide has developed several new almond varieties; these new cultivars have opened up new pathways for growers and new opportunities for the industry. L&T Nursery are committed to supporting the almond industry in these ventures through providing an avenue for access to both traditional and new varieties. Traditional varieties have shown their capacity in relation to quality and yield, however, several varieties recently released have shown strong results in these areas. It is the distribution of these promising new varieties, alongside continuing production of traditional varieties that L&T Nursery is excited to explore. The growth of the Australian almond industry depends upon a solid foundation, with innovation and expansion from this central core. The approach that L&T Nursery has employed is modelled around this ideal.

We have a commitment to unrestricted supply of high quality trees. It is a great time to visit and view the trees and see why feedback from growers has been so positive. L&T Nursery is excited about building upon this success with further growers, to help strengthen the Australian almond industry.

Alongside involvement in nursery production, L&T Nursery are also almond growers. This gives L&T Nursery a holistic understanding of the most important elements of almond production and the requirements of growers. This knowledge allows L&T Nursery to better cater to grower requirements in the production of young trees.

L&T Nursery understands that planning ahead and securing trees is critical to create a well-functioning orchard; as such **we are currently taking orders for both the 2017 and 2018 winter planting.** Orders are also currently being taken for the current winter season for any re-planting or development needs. L&T Nursery are happy to work closely with growers throughout the cultivation of their trees.

L&T Nursery have a good supply of the following rootstocks to support your almond variety requirements:
Traditional Rootstocks – Hansen (peach and almond hybrid), Bright's Hybrid (peach and almond hybrid).
Predominant Rootstocks – Nemaguard (peach seedling), GF677 (peach and almond hybrid).
New Rootstocks – RootPAC-R (plum and almond hybrid), Garnem (almond and peach hybrid).



Enquires relating to orders or nursery visits, may be directed to:

Tim on 0407 883 992 or timmillen68@gmail.com

or

Lynn on 0408 225 831 or lynntolley@live.com.au

Varroa eradication requires Emergency Plant Pest Response Levy approved by the Australian Almond Industry in 2006 to be activated following industry consultation period

The varroa mite (*Varroa jacobsoni*) biosecurity incursion at the Port of Townsville on 27th June 2016 is being addressed under an agreed eradication response plan that is to be funded by government and affected industries under the Emergency Plant Pest Response Deed (EPPRD). In 2006 the Australian Almond Industry agreed to a nil-rated Emergency Plant Pest Response Levy (EPPRL) and agreed that it is to be activated in the event of an eradication response.

As one of the industries highly dependent on honeybees for pollination the Australian almond industry's share of the varroa mite eradication cost of \$2.5 million is \$317,404. The Commonwealth Government will underwrite this and it is proposed that this be repaid over a three-year period 2016/17 to 2018/19. To meet this repayment obligation, the ABA Board has endorsed an activation of the emergency response levy from nil-rated to a levy of:

- \$0.00100 per per kilogram for almonds in their shells; and
- \$0.00133 per kilogram for shelled almonds.

This levy will be deactivated once the almond industry's cost share is recovered.

The response plan has been developed to provide a high degree of surety that the varroa mite will be eradicated, and the implementation achieved to date appears promising. The eradication plan includes establishing exclusion zones, location and destruction of feral hives and surveillance of managed hives. Several surveillance methods are being used including queen pheromone traps to capture male bees, sweep netting of flowering plants and feeding stations to attract foraging bees.



In considering the value of funding the eradication activities, the ABA Board was mindful that the cost per hive in the USA for almond pollination is more than A\$250 due in part to the additional management costs incurred by apiarists to control varroa mite. The additional annual cost to the Australian almond industry for pollination services, should hive costs rise to the Californian level, is more than \$22 million per year.

Activating the EPP Levy

The EPPRD covers the management and funding of biosecurity incursion responses to emergency plant pest (EPP) incidents. The Deed also formalises the role of industry participation in decision making and the contribution towards the costs.

The Australian almond industry agreed to enact a levy set at \$0.00 in August 2006 and made formal application for the establishment of this levy to sit alongside the almond R&D levy.

The varroa mite eradication will be the almond industry's first use of the EPP levy. The levy is compulsory for all growers and will be collected by the Commonwealth Government's Levies Revenue Service, in the same way as the existing R&D levy.

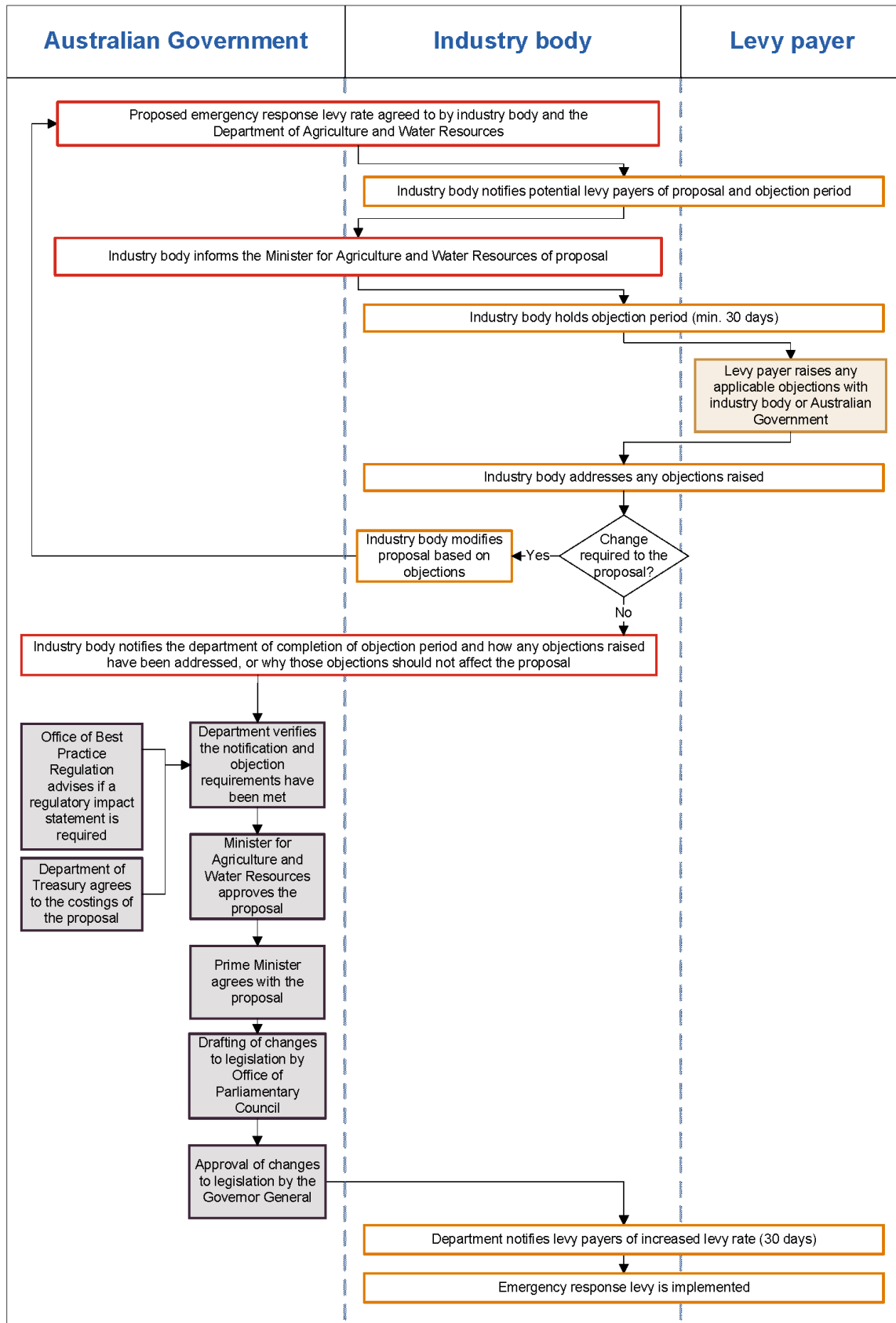
The flowchart shown on the next page depicts the process involved for activating the almond industry's EPP levy. The process can take up to six months from start to finish.

The following steps are being undertaken:

- The ABA, as the industry representative body for almonds, is applying to the Minister of Agriculture and Water Resources requesting that the EPPRL be activated to a rate of **\$0.00100 per per kilogram for almonds in their shells; and \$0.00133 per kilogram for shelled almonds** until the cost to the almond industry is recovered
- Commencement of a consultation period, where growers with any comments or concerns about the levy should discuss them with Andrew Downs, ABA Industry Development Manager adowns@australianalmonds.com.au or 08 8584 7053 or levies.policy@agriculture.gov.au

Please note that the consultation period commences 13th April and closes on 12th May 2017

Varroa Eradication



In the Orchard

Brett Rosenzweig INDUSTRY DEVELOPMENT OFFICER

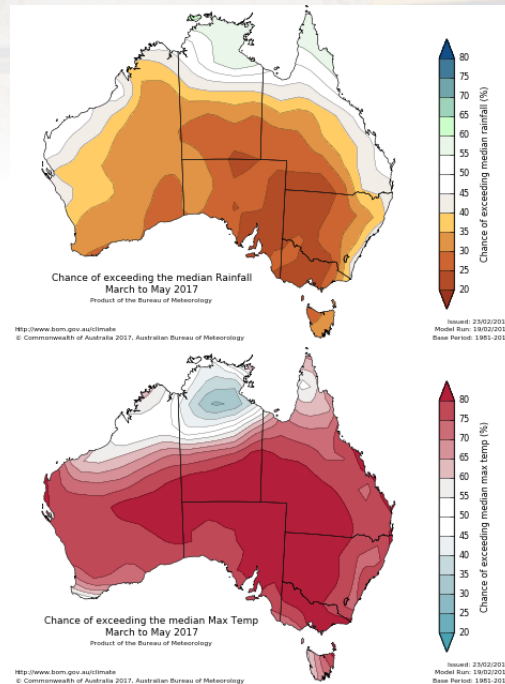
In this edition of In The Orchard... the focus will be on harvest, post-harvest fertigation and planning for tree requirements for winter 2018

Harvest

The cool spring period of 2016 has delayed the maturity of most crops and across the board harvest is 2-3 weeks later than last year. Whilst the forecast for the coming months is warm and dry, changes to common harvest practices could shorten the overall harvest time whilst maintaining good product quality.

The practice of 'conditioning' is where the windrowed almonds are run through the pickup, removing debris like dirt and leaves, then placed back into a windrow ready for the final pickup and temporary storage in bunkers. Conditioning is normally used during wet harvests where almonds on the ground are wet due to rain or for very late varieties like Monterey which are difficult to dry during late autumn. The process of conditioning removes the debris from the window after sweeping and leaves the almonds sitting on top of the ground thus enabling a faster rate of drying.

Conditioning also enables the final pickup process to occur at a faster speed. Rather than waiting for the almonds to dry to the correct moisture percentage before sweeping, windrowing and the final pickup, consider sweeping and conditioning within a day after shaking and then waiting for the correct moisture percentage before the final pickup.



Chances of exceeding median rainfall and maximum temperatures, March to May 2017



Planning for 2018 tree deliveries

If you're planning on planting spring budded almond trees in winter 2018, order your rootstocks **NOW**. Why? Let's look at the timeline required to produce a 1200mm spring budded tree.

Mar/Apr 2017

Rootstocks order placed with nursery

May-Aug 2017

Rootstocks are propagated by suppliers

Aug-Sept 2017

Rootstocks are planted by nurseries

Nov-Dec 2017

Budding occurs

Dec-June 2017/18

Trees are grown in the nurseries

July 2018

Delivery of one year old tree occurs

If a grower only notifies their nursery of their choice and quantity of rootstock in July/August, there is not enough time for the rootstock propagators to bulk up enough rootstocks to meet current industry demand, especially for hybrids propagated by tissue culture or cuttings. Late orders for rootstocks only place the rest of the supply chain under pressure and can result in less than optimum trees being delivered. The current budding season has certainly been less than ideal due to the cool spring weather delaying the maturity of the budwood mother trees and slowing rootstock growth, hence the main budding occurred during late December/January. Through no fault of the nurseries, tree height may not be to the standards usually expected.

Continued...

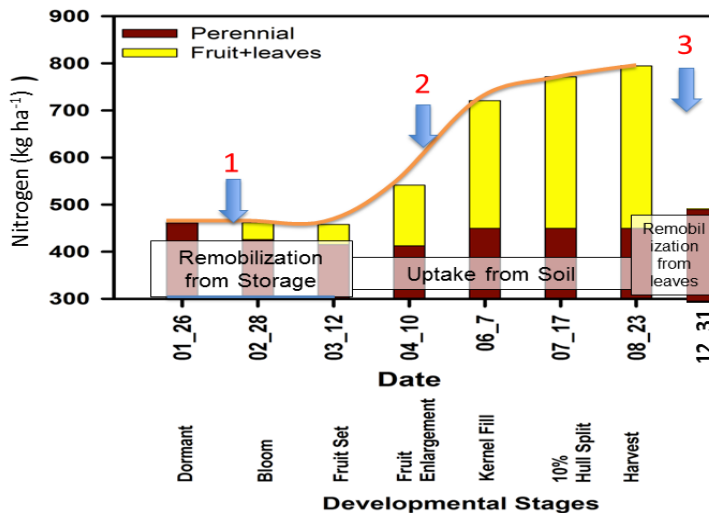
In the Orchard

Post-harvest fertigation

Previous autumn editions of In A Nutshell have highlighted the importance of starting post-harvest fertigation in March to ensure good uptake, usually 25% of the annual fertiliser budget. Good fertiliser uptake by the tree in autumn helps maintain nutrient storage over dormancy and sets the tree up for early growth during bloom to fruit set.

This season the message is the same but with more of a focus on current tree health. The cool spring and frequent rain events has led to a higher than normal potential for Almond Rust. It's normally this time of year any inefficiencies in the spring spraying program show up, especially after trees are shaken for harvest. If the amount of canopy in the tree is severely reduced by rust, consider reducing or even not applying the post-harvest fertiliser program. Applications of fertiliser need to be carefully applied to not promote new growth i.e. little but often. New growth after harvest only uses stored carbohydrates that are needed for next season's flowering and early leaf-out. The new growth will eventually be infected with rust and difficult to remove at defoliation, leading to probable infection of next year's canopy.

Pattern of Nutrient Demand in Almond



Periods of potential Short Term Deficit

- Flowering, fruit set, early leaf growth**
 - Critical processes occurring at a time when root uptake is limited.
- Kernel Fill**
 - Large yield dependent demand
 - Limited new root growth
- Senescence and remobilization**
 - Very limited root growth
 - Harvest induced water stress
 - Shaker stress



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MANAGING CARPOPHILUS BEETLE IN ALMONDS



Continuing the recent theme of orchard hygiene, it is important to remember the role of maintaining high levels of orchard hygiene throughout the harvest period and in preparation for the commencement of the new season to reduce the incidence of pests and disease.

The following reinforces that all growers need to maintain their focus on achieving high levels of hygiene to minimise the impact and cost of controlling Carpophilus Beetle. As more research is conducted, this forms part of an update during the life of this project. This article contains information on how best to apply an A&K strategy to monitor and control Carpophilus in almonds using the current stonefruit lure.

We consider this an interim guide for interested growers, and as we continue our research we aim to provide growers with more detailed guidelines specific to almonds, and hopefully a more effective co-attractant solution and insecticide strip with no pheromone button.

CARPOPHILUS IN ALMONDS

Carpophilus beetles comprise many species with different preferences for fruit type and fruit ripening/ maturing stage. In recent years, almond growers have indicated significant crop losses due to Carpophilus, and there is an urgent need for an Attract and Kill (A&K) system that can control these pests, particularly in the 'hull-split' development stage when almonds are most vulnerable to attack. During the 2014/15 and 2015/16 seasons, five species of Carpophilus were detected in samples from traps in almond orchards. Concerns that beetle populations could escalate over coming years has led to the research project "Management of Carpophilus beetles in almonds" to look specifically at this problem. This project includes research on the distribution of different Carpophilus species throughout orchards and in different almond growing regions, testing whether the "stonefruit"

lure is effective in almonds and how its potency might be improved, and determining the most effective spacing of A&K traps to achieve control.

IMPORTANCE OF ORCHARD HYGIENE

Some almond growers and processors dispose of rejected kernels, hulls etc. on their own property. These dumps, particularly in damp areas, can provide an important resource for Carpophilus during winter and early spring if they offer good protection and breeding sites. Similarly, fallen almond mummies, especially in the tree lines are suitable for these beetles to feed and breed and large numbers of Carpophilus have been found in these situations. These dumps and mummies might be the only widely available resources for the pest during early spring and it is likely the populations of Carpophilus they

support could contribute significantly to levels of the pest in orchards as the new almond crop becomes susceptible to damage. Mummies retained on trees also harbour carob moth and are the major source of moths leading up to hull split. **Management of almond waste and mummies should be considered as an important aspect of the overall management of Carpophilus and carob moth.**

Carpophilus have been found in spring in almond mummies on the ground near dripper lines where the nuts are kept moist. Inspection of these nuts may help producers to identify infested blocks and highlight areas where monitoring traps should be installed.

High priority blocks to monitor are likely to include those that experience excessive moisture retention and humidity such as low lying areas and sites near dams

KEY POINTS

- ▶ Almonds are most vulnerable to attack from Carpophilus Beetle during hull split.
- ▶ Pheromone and co-attractant are much less effective when used separately rather than in combination.
- ▶ High priority blocks to monitor are likely to include those that experience excessive moisture retention and humidity.
- ▶ It is suggested that growers start with at least one trap per orchard block (approx. 20 ha).
- ▶ Carpophilus starts to become active and able to fly to traps as temperatures increase in late winter/early spring.

and other water sources. In addition, blocks with a history of insect damage, hull rot and orchard hygiene issues should be given attention.

PREPARATION FOR SEASON 17/18

HOW ARE THE TRAPS USED FOR MONITORING?

Considering the limited information regarding *Carpophilus* in almonds, it is recommended for growers to begin to monitor this pest using the synthetic co-attractant and insecticide strip without pheromone, and manage traps with weekly servicing.

HOW ARE THE TRAPS USED FOR ATTRACT AND KILL?

Growers who are concerned by the numbers they catch in monitoring traps and choose to employ the current A&K system, must understand that it has not yet been fully evaluated or adapted for almonds and has not been registered for that purpose. The only difference between traps used for monitoring versus A&K traps: is that A&K traps include the long-range aggregation pheromone as well as the synthetic co-attractant solution and insecticide strip.

Once *Carpophilus* beetles infest and start to feed on stone fruit, they emit their own pheromone which competes with the pheromone used in A&K traps. In addition, ripening fruit and nuts at hull split or beyond also emit odours that attract the beetles and compete against the traps. Therefore, to be effective, A&K traps need to be installed early enough to kill the maximum number of beetles before the fruit or nuts become susceptible to *Carpophilus* damage. The aim is to prevent fruit or nut infestation by the beetles. As suggested earlier, successful use of A&K to protect stone fruit relies on reducing beetle populations to below a threshold level before fruit becomes susceptible to damage i.e. before ripening. This is likely to be equally important for almonds, although the threshold levels in the two crops may differ.

USEFUL RESOURCES

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W bugsforbugs.com.au

Department of Economic Development, Jobs, Transport & Resources (DEDJTR)

Dr Mofakhar Hossain PhD
mofakhar.hossain@ecodev.vic.gov.au



Carpophilus Catcha Trap Kit

TRAPPING METHODOLOGY

HOW MANY TRAPS ARE REQUIRED?

- The high trapping densities used in high-value stone fruit orchards (e.g. 1 trap/ ha to monitor and 2-3 traps/ ha for A&K) are not likely to be feasible in large almond orchards for economic and management reasons. For monitoring therefore, it is suggested that growers start with at least one trap per orchard block (approx. 20 ha) to gain some preliminary information on the distribution of the pest within their orchard.
- We cannot advise on the number or placement of A&K traps in almonds until the A&K system for *Carpophilus* is adapted and registered for use in almonds.

WHERE SHOULD TRAPS BE LOCATED?

- Given the very low trapping density likely to be used in almonds no specific recommendation can be made for locating traps for monitoring, other than placing them at least 15 metres inside the orchard blocks and taking block history into account (e.g. nut damage, mummy infestation as mentioned above).
- For A&K in stone fruit, traps should be placed specifically in the appropriate corner of orchard blocks to allow for the most predominant spring and summer winds to distribute the pheromone into the blocks. For example, if the predominant wind direction is from the south west, traps should be located in the south-west corner. This is also likely to apply in almonds.
- Once *Carpophilus* activity is detected on a property, monitoring or A&K traps that repeatedly catch zero beetles may be relocated to:
 - other areas within the same block, to increase the chance of detecting *Carpophilus* 'hotspots' or;
 - infested blocks to increase the trapping density around the infestation.

WHEN SHOULD TRAPS BE USED?

- Carpophilus starts to become active and able to fly to traps as temperatures increase in late winter/early spring. Monitoring from that time onwards will provide an indication of activity levels of the pest in the vicinity of the traps.
- If A&K is to be used, it should be implemented at least eight weeks before the crop becomes susceptible to infestation by Carpophilus.
- In stone fruit the crop becomes susceptible as the fruit colour begins to change in response to commencement of the maturity process.
- Almonds appear to be susceptible to attack at and beyond hull split
- Some growers commence A&K much earlier (e.g. late August/early September) in areas where significant Carpophilus populations or crop damage were detected during the previous season.

HOW ARE TRAPS INSTALLED?

- Install traps on the southern side of trees so they are in a shady position. Traps in the sun are likely to get very hot and repel any beetles that land on them. Also, the effective life of pheromone buttons and co-attractant is likely to be much shorter in hot traps.
- Ram a metal star picket into the ground in the designated place and fit the metal ring to the picket so the trap will be about 1.5 m above the ground.

WHERE CAN TRAPS BE PURCHASED?

To obtain the traps, which are marketed as 'Carpophilus Catcha Trap Kits' and spare components, growers should approach their usual agricultural supplier. If difficulties in sourcing traps are encountered, please contact the Australian supplier 'Bugs for Bugs' via phone: 0459 974960, info@bugsforbugs.com.au or bugsforbugs.com.au

Graduated tubes are available from DEDJTR. To obtain a set of tubes, please email a request to mofakhar.hossain@ecodev.vic.gov.au.



Above: *Carpophilus mutilatus* (Confused sap beetle)
Source of images: Walker, K. (2007) PaDIL - <http://www.padil.gov.au>



Above: *Carpophilus hemipterus* (Driedfruit beetle)
Source of images: Walker, K. (2007) PaDIL - <http://www.padil.gov.au>



Above: *Carpophilus davidsoni* (Australian sap beetle)
Source of images: Walker, K. (2007) PaDIL - <http://www.padil.gov.au>



Above: *Carpophilus humeralis* (Pineapple Souring Beetle)
Source of images: Walker, K. (2007) PaDIL - <http://www.padil.gov.au>




Above: *Carpophilus dimidiatus*
Source of images: DEDJTR

MORE INFORMATION

Department of Economic Development, Jobs, Transport & Resources (DEDJTR)
Dr Mofakhar Hossain PhD
mofakhar.hossain@ecodev.vic.gov.au

Developing almond targets optimum



Almas Almonds 

Abby White, Technical Manager with Almas Almonds in the Sunraysia region, says the local team's focus is to get the best out of their trees, but also to achieve consistent yields.

Although relative newcomers to the almond industry from a business perspective, the team at Almas Almonds has plenty of experience and knowledge and it's being put to good use.

Now in its third season, Almas Almonds is growing strongly, with two established almond orchards in Sunraysia and a new 400-hectare property under development in New South Wales.

The two mature orchards are situated at Buchanan, near Boundary Bend, and Bannerton in the Sunraysia region, totalling about 711ha, with 296 trees planted per hectare.

The Bannerton orchard comprises 428ha of Non Pareil and Carmel almond varieties on Nemaguard rootstock planted in 2006, with 14ha of GF 677 hybrid rootstock planted in 2009.

The Buchanan orchard is 283ha of the same base varieties planted in 2007, along with 30ha planted in 2015.

Abby White is the company's Technical Manager and is responsible for developing each orchard's nutrition program.



and enterprise tree health

Abby joined the team in January last year, however she has been working with Almas since its first season in her previous role as a Sales Agronomist with Swan Hill Chemicals.

It's given her plenty of insight into the two properties and time to refine the nutrition programs to best suit each farm.

"We try and focus on value for money, particularly with the fertiliser program," Abby said.

"We use quite a strong foliar program, in combination with a tailored soil applied program for each farm because we deal with a range of soil types on each end of the spectrum of soils around the Sunraysia district."

The farms are both set up with drip irrigation and a fertigation system.

Abby said the fertigated program began at root activity at the start of August and continued through until December, with a small break before resuming post-harvest.

"We try to do 20-25 per cent of our program post-harvest, with harvest running from February 10 through to the end of April, depending on weather conditions," she said.

There are a range of products in the mix, but some of the key players include fertilisers Poly-Feed and Haifa Bonus, both manufactured by Haifa.

Abby said from post-flowering onwards, Poly-Feed was applied to the trees in two sprays to add nitrogen, phosphorus and potassium (NPK), along with trace elements.

"The phosphorus definitely helps during those early stages to get those leaves producing, because the roots can be quite slow to start the uptake of phosphorus," she said.

"During our November spray we introduce Bonus K, which gives us that boost of potassium and nitrate."

Both products have been included in Almas' nutrition program from commencement, as Abby had advised their inclusion and was already well aware of the benefits.

Abby said they sourced their Haifa fertilisers and some other nutrition products through Robinvale Ag Supplies and Swan Hill Chemicals.

"Number one for me is safety, rather than having raw pot nitrate. Having the extra wetters in the Bonus K makes a big difference," she said.

"Then it's the fact that I know I have reliable back-up if I need it and that I'm using a good quality product.

"Both Poly-Feed and Haifa Bonus are a lot easier to add in the tank and they dissolve easily, so we don't have to worry about long mixing times."

Poly-Feed is a fully water soluble NPK fertiliser used by Almas as a foliar spray, enriched with high concentrations of micronutrients.

Haifa Bonus is a water soluble foliar fertiliser, based on Haifa's Multi-K potassium nitrate, commonly used to improve yields and quality.

Almas apply Haifa Bonus as a foliar spray, while Multi-K is applied through their fertigation system.

Last season, Abby said one of the mature orchards received potassium nitrate from Multi-K as the only form of potassium, applied at 320 kilograms/ha over the season.

She said the other mature orchard received a mix of Multi-K and potassium sulphate for a total 380kg/ha over the season, with a focus on Multi-K early in the season and potassium sulphate added through the second half of spring and post-harvest.

Maximising yields is obviously a big focus for the team at Almas and Abby said they had to first concentrate on optimising tree health.

"We've gone from having big yields in one season to less the next, so we've been trying to come out of that biannual pattern and this season we were somewhere in between, which means we're making progress," Abby said.

"We've done quite a bit of heavy pruning, which has kept total yields down, but the main focus is getting to a stage where we can get the best out of our trees, but also have consistent yields."

Abby said she had found both Poly-Feed and Haifa Bonus to be particularly beneficial in the early tree growth stages, which had been demonstrated in the 28ha of new trees planted in their Sunraysia orchards.

"Those trees had Poly-Feed and or K in nearly every tank and I've had comments from people that those are some of the best one-year- trees that they've seen."

"Those products are particularly good for the early stages of development, which is why they will also play a big role in the development of our new orchard in New South Wales," she said.

Media information: Jon Corona, Haifa Australia, on 0408 568 605.

Secure Flowering, Secure Yields

When it comes to securing consistent high yield in almonds, there is no more important window in the growth cycle than the flowering and setting period. While there can be a number of factors that lead to below average yields, the reduction in nut setting from poor pollination and inconsistent fertilisation are factors which can be improved upon every season with some preventative effort. Poor pollination is often attributed to low bee activity in the trees during the bloom period. Taking steps to enhance bee presence throughout orchards during flowering is a logical management practice to implement to enhance yields through achieving more consistent pollination.

Beekeeper is a product distributed by Barmac to rural outlets across the country that is used for attracting bees to flowering crops. This popular product contains a mixture of honey bee pheromones and is sprayed onto orchards for the very purpose of increasing bee activity within the trees to convert more flower contact into successful, uniform pollination. Beekeeper is cheap insurance to pay to make sure bees are active in your orchard during flowering to ensure consistent pollination occurs and removes at least one of the obstacles that stands in the way to achieving a secure yield.

Another aspect during the flowering period which is commonly problematic in almonds is caused by inadequate boron nutrition. Boron is an essential nutrient that plays an incredibly critical role in ensuring pollination translates into successful fertilisation. After pollination occurs (the transfer of male pollen to the female stigma), a pollen tube normally grows down from the stigma to the ovary below where the egg is located. This tube is required to deliver the male pollen to the egg and allows fertilisation to take place, however when boron is deficient during this short phase, pollen tube growth is severely affected to the point where fertilisation cannot occur. Foliar spraying boron leading up to and during early bloom has become an increasingly popular and effective nutrition management

strategy to ensure boron is present and mobile within the flower to support strong pollen tube development. Boron mobility within the flower is the key to ensuring uniform fertilisation throughout the tree occurs and setting of nuts follows uniformly throughout the orchard. Barmac recommends the use of Manni-Plex Boron in almond trees leading up to and during early bloom to ensure boron is present and mobile within all the floral reproductive parts to ensure the fertilisation process is completed and an optimal nut set is secured across your orchard. The addition of Manni-Plex Boron and Beekeeper into your flowering program is a practical strategy to secure tree yields and boost your returns.

Nutrient mobility within trees was a topic recently discussed in Australia by Adelaide born Dr Patrick Brown, Professor of Plant Nutrition in the Department of Plant Sciences at the

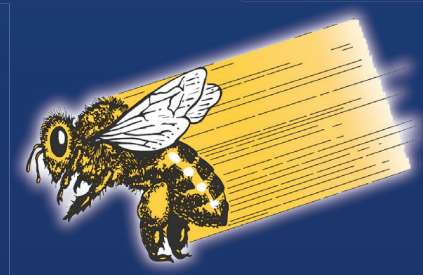
University of California. Dr Patrick Brown recently completed a tour of South Australia, Victoria and New South Wales, speaking on nut trees and their nutritional requirements. Dr Brown's initial work in Australia found polyols (sugar alcohols), produced naturally in plant leaves, were the key to enable mobilisation of nutrients within the plants to active growth sites where they are required. Since 2003, Barmac has been distributing the Manni-Plex foliar fertiliser range around Australia. Manni-Plex is built on sugar alcohol complexed nutrient formulations, based on Dr Brown's research. Manni-Plex products include a complex of humectants, spreaders and several forms of sugar alcohols, to aid nutrient absorption and mobilisation with plants.

For more information contact Barmac.

Secure Flowering, Secure Yields



- Mimics bees pheromones
- Improves bee activity
- Increases fruit/nut set
- Pleasant lemon odour



- Increases the percentage of fruit/nut set
- Rapidly delivers boron into phloem and xylem
- Improves boron mobility in flowers
- Chloride free & plant safe formulation



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For more information contact Barmac on 07 3802 5050 for your nearest Barmac Territory Manager.

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australian
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RESEARCH & DEVELOPMENT FORUM & FIELD DAY

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Where:

LOXTON RESEARCH CENTRE &
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When:

24th & 25th OCTOBER 2017

Program:

Tuesday 24th

- RESEARCH PRESENTATIONS & UPDATES FROM ALMOND INDUSTRY PROJECTS
- ALMOND BOARD OF AUSTRALIA AGM

Wednesday 25th

- MACHINERY DEMONSTRATIONS
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Nut General Level Health Claims - What does this mean for you, and how do you capitalise?

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2017 Events

APRIL

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

April

- 5** Food & Hotel Indonesia Exhibition begins, Jakarta
- 8** Food & Hotel Indonesia Exhibition ends, Jakarta
- 14** Good Friday Public Holiday
- 17** Easter Monday Public Holiday
- 25** ANZAC Day Public Holiday
- 28** Fitness Exhibition Melbourne begins
- 30** Fitness Exhibition Melbourne ends

MAY

SUN	MON	TUE	WED	THU	FRI	SAT
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

May

- 4** Almond Centre of Excellence Committee Meeting, Loxton Research Centre
- 11** ABA Market Development Committee & ABA Board Meeting, Mercure Hotel, Mildura
- 12** Production Committee, Plant Improvement Committee & Pollination Committee Meetings, Mercure Hotel, Mildura
- 17** SIAL China Exhibition begins, Shanghai, China
- 19** International Nut Congress begins, Chennai, India
SIAL China Exhibition ends, Shanghai, China
- 21** International Nut Congress ends, Chennai, India

JUNE

SUN	MON	TUE	WED	THU	FRI	SAT
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June

- 2** Good Food & Wine Exhibition begins, Melbourne
- 4** Good Food & Wine Exhibition ends, Melbourne
- 12** Queen's Birthday Public Holiday
- 22** Processing Committee Meeting, Mercure Hotel, Mildura
- 23** Good Food & Wine Exhibition begins, Sydney
- 25** Good Food & Wine Exhibition ends, Sydney

Triple Almond Cookies

If you love almond flavours, then you are going to absolutely love these Triple Almond Cookies! They are packed full of almond flavor. Almond extract, chopped almonds and almond toffee bits. They are dangerously delicious!

Ingredients

- 1 cup butter, softened
- 2 cups sugar
- 1 cup sifted icing sugar
- 1 cup vegetable/canola oil
- 2 eggs
- 1 tsp almond extract
- 4 1/2 cups flour
- 1 tsp baking soda
- 1 tsp salt
- 1 tsp cream of tartar
- 2 cups sliced almonds
- 1 batch (200g) toffee almonds ([recipe here](#))
- additional sugar for rolling cookies

Instructions

Preheat oven to 175°C. Beat butter at medium speed of electric mixer until creamy. Gradually add sugar and icing sugar, mixing well. Add oil, eggs and almond extract, mix well. In separate bowl combine flour, baking soda, salt and cream of tartar. Add to butter mixture, mixing well. Blitz toffee almonds in food processor until large chunks. Stir in almonds and toffee bits.

Scoop cookies with a medium cookie scoop (2 Tbsp). Roll dough in granulated sugar and place on a lined baking tray. Flatten cookies in a criss-cross pattern with a fork dipped in granulated sugar.

Bake for 10-12 minutes. Cool slightly on pan and remove to wire rack to cool completely.

Makes approximately 5 dozen

For more delicious almond recipes visit: www.amazingalmonds.com.au