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## From the Dean's office...



The School of Agriculture, Food and Wine had a very good year in 2015 with some significant milestones and achievements reached. The School established three new Departments – Agricultural Science with A/Professor Jason Able as its head, Plant Science led by Professor Steve Tyerman, and Wine and Food Science led by Professor Vlad Jiranek. The first students were enrolled in the Bachelor of Applied Biology; this innovative program is expected to grow significantly in the future. Under the leadership of Sigrud Heuer, the ARC Research Hub for Wheat in a Hot and Dry Climate was launched in September. The University of Adelaide-Shanghai Jiao Tong University Joint Laboratory for Plant Science and Breeding was opened and Prof Dabing Zhang was appointed a joint Professor between the Universities, a first at The University of Adelaide. Six new joint PhD students between the University of Nottingham

and the University of Adelaide were enrolled as the first group in a program that is set to continue this year. The School launched this newsletter and blog last year, which has become an important medium to reach a wide range of stakeholders. However on a less positive note, Waite Analytical Services ceased operation last year.

The New Year has just begun and already there is good news to report. We have seen a significant increase in the numbers of new student offers made in our undergraduate degree programs. Based on acceptance rates from previous years, we expect to see strong growth in enrolments in the Bachelor of Agricultural Sciences, and steady numbers or modest growth in our other programs.

The Minister for Agriculture, Food and Fisheries, the Hon. Leon Bignell, announced the opening of the South Australian Food Innovation Centre (SAFIC) in January. The School (through Bob Gibson, Geoff Fincher and myself) has played a prominent role in the planning and establishment of SAFIC, which will be based at the Waite Campus. Together with PIRSA/SARDI, the Australian Wine Research Institute, UniSA, Food SA, the Royal Agricultural & Horticultural Society of SA and Food Innovation Australia Ltd, we will now gear up for the

operation of the new centre, which will be established in stages.

The coming year will undoubtedly bring more positive developments. A new website will soon be launched for the Waite Campus. It will serve as a single point of information about the collective Campus, including links to all the partner organisations and key contacts. For employees and students, it will facilitate interactions across the Campus by advertising events and seminars, disseminating notices, and advertising jobs, among other features. Users will be able to subscribe to a calendar service that highlights upcoming events, so everyone is aware of what is happening at the Waite.

The Campus partners have also applied to host a TedX event at the Waite Campus in July 2016. This will showcase some of the incredibly talented people who are associated with the Waite Campus and build our sense of pride. Watch our newsletter or blog for information about this forthcoming event.

Professor Mike Keller



## Awards, honours, promotions

**Dr David Jeffery**, Senior Lecturer in Wine Science, is the Royal Australian Chemical Institute's Peter Alexander medallist for 2015.

The Peter W. Alexander Medal (formerly known as the Robert Catrall Medal) is awarded for excellence in pure or applied scientific work in analytical chemistry in Australia, and for service to Analytical Chemistry. This award specifically recognises these contributions from individuals within the first 10 years of that person's career.

**Rachel Burton** was promoted to Professor in late 2015, acknowledging her dedication, leadership and expertise across a range of roles and responsibilities.

## Cycling in the Tour Down Under - Waite For Us!

On 22nd January, six bicycle riders joined the Waite For Us! team in the Tour Down Under - BUPA Challenge ride that ended at Victor Harbor. The team members - Mike Keller, Peter Hayman, Chris Ford, Allan Ryan, Peter Eitom and Helen Brown - rode up to 142 km as a test of their fitness.



# Waite Community Garden opened

The Waite Community Garden was officially opened on a perfect Spring day in October by celebrity gardener Sophie Thomson (pictured), with a big crowd of staff, students and kids from the Campus child care centre in attendance to celebrate the occasion. Sophie provided some inspiration on the health and wellbeing benefits of gardening, noting the huge increase in interest in community gardens over the last 10 years, and congratulated everyone involved in the project.

With a \$15,000 grant from the University's Ecoversity program, the School of Agriculture, Food & Wine has set up the new Waite Community Garden together with CSIRO. Ryan Farquharson, a senior scientist at CSIRO Agriculture and a number of his colleagues previously ran their own vegetable garden but joined forces with Stuart Matthews and the

School team to re-site and enlarge the garden for common use and enjoyment. A community garden has long been an idea enjoying wide support and is very much in keeping with both the agricultural focus and the co-location of several complementary organisations on the Waite Campus, but it has taken persistence and effort by a number of people to bring it to reality.

The launch was a feel-good event with much community and family spirit in evidence. The Waite Community Garden is located between McLeod House and Urrbrae House and is open to everyone interested in getting their hands in the dirt and learning more about growing their own food. For more information about how to join in, visit the Facebook page at [www.facebook.com/WaiteCommunityGarden](http://www.facebook.com/WaiteCommunityGarden)





# New app to assess powdery mildew on grapes

Visual assessment of the grape and wine sector's most costly disease, powdery mildew, will now be easier with a new, free smart-phone app developed by University of Adelaide researchers and collaborators.

The recently released iPhone/iPad and Android app, PMapp, will help grapegrowers and wineries make informed decisions about the quality and price of grapes.

The development of PMapp has been supported by Wine Australia as part of a wider research project seeking to establish objective measures for quantifying powdery mildew. The app development has taken place in close consultation with a project reference group of viticulturists, wineries, independent assessors and researchers.

"Powdery mildew is a serious disease of grapevines worldwide and, in Australia, has an estimated annual cost of \$76 million through yield loss and the cost of control," says project leader [Professor Eileen Scott](#), Professor of Plant Pathology in the University's [School of Agriculture, Food and Wine](#).

"It causes serious quality issues with bad flavours and aromas in wine and we've seen that with small amounts of the surface area of Chardonnay bunches affected by powdery mildew there is an oily 'mouth-feel' in the resulting wine.

However, powdery mildew is hard to assess – the disease is common, but symptoms can be hard to see, or easily confused with dust or spray residue.

"PMapp is a simple tool that facilitates efficient assessment and recording of the severity and incidence of powdery mildew in the vineyard", said Professor Scott.

A key reference and browser of images built into the app also help the user familiarise themselves with various disease patterns and severities. A website to support the app is currently being developed and is scheduled for release at the end of January. The PMapp is now available on [Apple's App Store](#) or [Google Play](#).



## ConocoPhillips Science Experience

The University's Faculty of Sciences and the Faculty of Engineering, Computing and Mathematical Sciences joined forces late in the year to put on a three day program giving year 9 and 10 high school students from across the state the opportunity to engage in hands-on

activities and events at The University of Adelaide. Participants take part in sessions that can open their eyes to new possibilities in future study and careers.

A visit to the Waite in mid-December included sessions with researchers from the ARC Centres of Plant Energy Biology

and Plant Cell Walls and the School's Soils group, as well as a tour of The Plant Accelerator.

This program is also supported by Rotary and Young Scientists Australia (SA Chapter) and the Australian Science Teachers Association (ASTA).



Students in a Waite activity session during the ConocoPhillips Science Experience in December.

# Students linking theory with practice at Hart

Third year agricultural science students are combining theory with practice as part of a new partnership between the Hart Field-Site Group and The University of Adelaide's School of Agriculture, Food and Wine. A key component of the arrangement is for students to visit the Hart site to broaden their exposure to the issues facing farmers.

As Associate Professor Gurjeet Gill explains, the relationship with Hart is a great fit with the ag science program.

"Hart is a well-known farming systems group with an excellent reputation and it is so close to Adelaide," he said. "It's vitally important for our third year students, who will be working in the industry next year, to visit a site like Hart to look at some of the leading questions farmers need addressed

through research. We can use some of the trials set up by the Hart group as practical exercises for students to assess the effectiveness of different practices in managing those problems."

Associate Professor Glenn McDonald agreed, and said the trial work being conducted at Hart aligned with a lot of the content covered in agronomy subjects.

"It's a chance for our students to integrate theoretical and practical knowledge and to consider what the ultimate outcomes required for commercial farmers are," he said.

"Students can also look at opportunities for careers in agriculture by considering the role of farming systems groups in research."

A combination of lectures delivered in the Hart shed and hands on experience gained by sampling, measuring and recording trial work in the field adds diversity to the sessions.

Being able to speak to members of the Hart team, many of whom are farmers themselves, also helps students get a real sense of what the research is trying to achieve.

More information about the Hart field site group can be found at [www.hartfieldsite.org.au](http://www.hartfieldsite.org.au)



Hart chairman and Brinkworth farmer Justin Wundke talks to University of Adelaide third year ag science students about why time of sowing trial results are so important to his farming business

## AFW Research Day 2015

A total of 220 staff, affiliates and postgraduate students from across the School of Agriculture, Food & Wine, gathered at the Adelaide Pavilion on 5 November for the 2015 AFW Research Day. This annual off-site event is now a permanent fixture in the School's calendar, with the program of talks designed to showcase the breadth and excellence of the School's work across multiple disciplines and to stimulate networking and mutual awareness.

Instead of the usual poster competition, this year's Research Day featured film and slide images from across the School, and the various research facilities and platforms available at the Waite were also highlighted.

The program included presentations by the Pro Vice-Chancellor (Research Strategy), Professor Julie Owens, Director of the Robinson Institute, Professor Sarah Robertson, and Business Development and Partnerships

Manager at the Australian Science Media Centre, Dr Melanie Bagg. The cross-section of students, ECRs and experienced researchers and the mixture of short and long talks sustained the audience's interest, and there was plenty of opportunity for conversations and questions during the breaks.



# Headbanging Aussie bee takes a heavy metal approach to pollination



Research has for the first time revealed the heavy metal secret behind an Australian bee's unique approach to pollination: high-speed headbanging.

In an effort that would put metal fans to shame, the native blue-banded bee has been filmed head banging flowers up to 350 times a second. ([See the slow motion video](#))

The technique causes vibrations that release pollen into the air similar to the motion of a salt and pepper shaker, helping pollinate the flower.

More than just a biological curiosity, the discovery could open the door to advances in areas ranging from improving

the efficiency of certain crop pollination to better understanding muscular stress and the development of miniature flying robots.

The joint University of Adelaide, Harvard University, RMIT and University of California (Davis) study compared the pollination techniques of Australian native blue-banded bees with North American bumblebees, which are commonly used overseas to commercially pollinate tomato plants.

While their American counterparts grabbed the anther of the tomato plant flower with their mandibles before tensing their wing muscles to shake the pollen out, super slow motion footage revealed the bee from down under prefers a "hands-free" approach.

The research team found that by recording the audio frequency and duration of the bees' buzz, they were able to prove the Aussie bee vibrates the flower at a higher frequency than overseas bees and spend less time per flower.

With bumblebees not found on the Australian mainland, local greenhouse tomatoes are pollinated mechanically.

"Our earlier research has shown that blue-banded bees are effective pollinators of greenhouse tomatoes," says bee specialist [Dr Katja Hogendoorn](#), from the University of Adelaide's School of Agriculture, Food and Wine.

"This new finding suggests that blue-banded bees could also be very efficient pollinators - needing fewer bees per hectare."

RMIT researcher Dr Sridhar Ravi, from the School of Aerospace, Mechanical and Manufacturing Engineering along with Harvard colleague Callin Switzer, who did the filming, say it was the first time the phenomenon had been observed.

"We were absolutely surprised. We were so buried in the science of it, we never thought about something like this. This is something totally new," Dr Ravi said.

The research will be published in an upcoming print edition of scientific journal *Arthropod-Plant Interactions*.

## Recent Campus events and tours

A flurry of tours and events at the Waite in the last quarter of 2015 kept many staff and students busy. Visitors during this period included the Argentinian Ambassador, a Vietnamese delegation, a Livestock Consultants group (pictured

with Alan Hughes from SARDI), and a group of 20 international agents for the University.

Campus-based events late in 2015 included the CSIRO Waite Campus

Exhibition held in the Woolhouse Library, and Crush 2015, a national wine and grape science symposium held at the Plant Research Centre in November. Crush 2015 drew 130 researchers, academics and technical people from all the wine-growing states and research groups around Australia. Hosted and organised by the Wine Innovation Cluster (WIC), the Waite-based partnership of the four agencies involved in wine and grape research, the Crush program featured 31 presenters from several disciplines and ample opportunity for networking.

Events and visits like these are an important part of the Waite's outreach and engagement activity, and 2015 was definitely the busiest year ever in terms of demand, frequency and interest!



# Wine101x MOOC wins coveted Media Excellence and Wine Educator Awards

Congratulations to Associate Professor Kerry Wilkinson, Dr Cassandra Collins, Dr David Jeffery and Associate Professor Paul Grbin, the team responsible for the School of Agriculture, Food and Wine's AdelaideX MOOC, dubbed 'Wine101x'. Wine101x won the Government, Education and Non-Profit category of the 2015 South Australian Interactive Media Excellence Awards in October, then followed it up with the Best Educator Award at the Wine Communicators of Australia ceremony held in Sydney in November.

The SA Interactive Media Excellence Awards recognise the work of local digital innovators in categories including health, government and education, and lifestyle and entertainment. The WCA awards "recognise outstanding contribution to, and excellence in, wine communication in all its forms".

Wine101x: World of Wine: From Grape to Glass is a Massive Open Online Course (MOOC), delivered worldwide via the edX platform ([www.edx.org](http://www.edx.org)). First launched in April 2015 as a 6-week course, it comprises interactive media and e-learning resources delivered online, for free, with no pre-requisites. Through the wonders of the internet, Kerry and the team shared their expertise and passion for 'all-things-wine', to give more than 18,000 participants from over 160 countries an appreciation for the principles and practices that underpin grape and wine production, and their impacts on wine style and sensory properties (with an unashamedly Australian flavour). The course encompassed short video lectures from Kerry, Paul, Cas and Dave, video interviews with industry professionals, interactive activities such as a virtual winemaking app, discussion forums and several assessment tasks to evaluate

learning. By popular demand, Wine101x was released again in June 2015 in self-paced mode, with more than 30,000 total enrolments to date.

The success of the first MOOC has prompted Kerry, Paul, Cas and Dave to start thinking about Wine201x. "There was a good deal of interest from learners around wine tasting, so the next course may contain online wine appreciation classes and themed virtual tastings, Kerry said.

In the meantime, cellar door staff, marketers, accountants, vintage casuals and anyone else interested in learning about grapes and wines can still take the award-winning online course, [Wine101x](#).

## Joint UA-SJTU Laboratory for Plant Science and Breeding opened

Late November saw the Deputy President of Shanghai Jiao Tong University, Professor Lin Zhongqin, and a senior group of SJTU officials join local staff, State Government representatives and guests to officially open the Joint UA-SJTU Laboratory for Plant Science

and Breeding. The Laboratory, led by Professor Dabing Zhang, is the first joint agricultural initiative to come to fruition between the two Universities as part of the Australia/China Centre for Agriculture and Health agreement, signed in 2013.

The opening involved the unveiling of the plaque in the Plant Genomics Centre, with speakers from both Universities highlighting the benefits of the partnership and their plans for further development of mutually beneficial collaborative opportunities. As well as the laboratory opening at the Waite, the SJTU group was in Adelaide to sign a formal Memorandum of Understanding as well as meeting with senior UA staff to discuss financial, strategic and operational management matters.

The SJTU group also enjoyed a short tour as part of their Waite visit on Thursday.



Professor Dabing Zhang (centre) with his group.



# Stefanie Wege awarded DECRA and Edith Dornwell medal

Dr Stefanie Wege (pictured below), our recent ARC DECRA fellow awardee, was awarded the University of Adelaide Faculty of Sciences Edith Dornwell medal for 2015 for her achievements as an Early Career Researcher. Since coming to our lab last year she has had two *Plant Physiology* papers accepted, a *Nature Communications* paper and the award of the DECRA. Stefanie's research focuses on chloride acquisition and management by plants. Chloride is a plant macronutrient but is also one of the ions responsible for salt stress.



## Discovery of the first vacuolar phosphate transporter

Collaborative research between the University of Adelaide, Zhejiang University in Hangzhou, China, La Trobe University and University of Western Australia has identified the first phosphate transporter in vacuolar membranes. Dr Chuang Wang and Prof. Steve Tyerman from ARC Centre of Excellence in Plant Energy Biology demonstrated that OsSPX-MFS3 transported phosphate and is responsible for release of phosphate stored in leaf vacuoles of rice. The research was published in *Plant Physiology* in December. doi: <http://dx.doi.org/10.1104/pp.15.01005> *Plant Physiology* December 2015 vol. 169 no. 4 2822-2831

## Highly cited authors

One measure of impact for scientists is the number of times they are cited by their peers. Professor Steve Tyerman and A/Professor Matthew Gilliham have been recognised by the American Society for Plant Biologists as highly cited authors. They were 2 of only 11 researchers from Australia in the ranking, which only contained 100 researchers worldwide. See <http://c.ymcdn.com/sites/my.aspb.org/resource/resmgr/docs/aspbtopauthors.pdf>

Professor Dabing Zhang, now dividing his time between Shanghai and Adelaide, also made the list for Asia. The ranking covers the period 2009-2013.

The Tyerman and Gilliham Labs also have a new website highlighting their research and the people involved <http://www.plantransig.com/> and the lab has the twitter handle @plantransig.

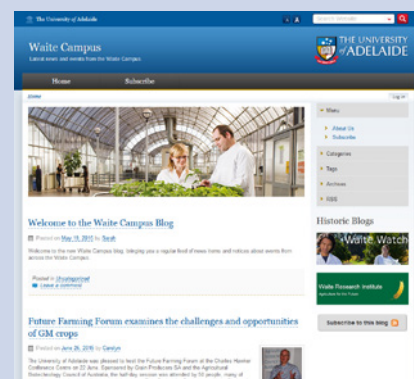
# Stressed out plants on the TV

The PEB Centre's work on a new plant stress signal has featured on Channel Ten's Children's Science program SCOPE <http://tenplay.com.au/channel-eleven/scope/season-3/episode-84>. This was one of many media outlet's that picked up this story highlighting research that was carried out at the Waite. A recent follow up to the original *Nature Communications* paper mid last year has been an article in *Trends in Plant Sciences*, the second highest ranking plant journal describing how GABA can act as a novel stress signal in plants <http://www.cell.com/trends/plant-science/abstract/S1360-1385%2815%2900301-5>



## Want Waite news more regularly than our quarterly newsletters?

The [Waite Campus Blog](http://blogs.adelaide.edu.au/waite/) has now been launched and will run in parallel with this newsletter. If you would like to receive more regular Waite news updates via e-mail, subscribe now at <http://blogs.adelaide.edu.au/waite/subscribe/>.





# Waite researchers take on International Wheat Yield Partnership projects

Future global food security is front and centre for projects funded by the [International Wheat Yield Partnership](#) in late 2015. The ultimate aim of the initiative is to raise the genetic yield potential of wheat by up to 50% in the next two decades. IWYP have awarded eight projects worldwide that propose to work towards that aim and three of these involve researchers at the Waite.

Dr Stuart Roy (Australian Centre for Plant Functional Genomics (ACPF)) will lead one project entitled 'Three High Value Genes for Higher Wheat Yield'. A/Professor Sigrid Heuer, also of the ACPFG, will collaborate with researchers at the Australian National University (ANU), researchers in the UK and in Mexico on the efficiency of wheat photosynthesis, and A/Professor Matt Gilliam at the ARC Centre of Excellence in Plant Energy Biology will collaborate with researchers at ANU, the University of Western Australia and in CIMMYT in Mexico on improving the energy use efficiency of wheat.

## The Who's Who of AFW ...

*Each issue, we'll profile a different AFW School Office staff member so you can put a face to the name and know who to go to for what! This issue, it's ...*

### Helen Brown



My name is Helen Brown and I am Manager of the Teaching Unit at the Waite Campus.

I work in a team of 4 technical officers that organise laboratories for student practicals ranging across soil, plant, agriculture, microbiology, biochemistry and oenology subjects.

I have worked at the University (in different areas with many staff on varying tasks) for 31 years, but not one day has been the same as any other and I very much enjoy what I do.

Outside of work I enjoy bike riding, exploring Australia, knitting and reading.

## Almond Breeding Program delivering benefits to industry

Australia's almond industry is going from strength to strength, in part thanks to the Waite's almond breeding program. Following steady growth over the past 40 years and drought-proofing drip irrigation techniques adopted as a result of the millennium drought and trials by the Almond Board of Australia, the Australian industry is now in a good place. With increasing global demand, 70 per cent of Australian-grown almonds are now destined for export, and 2015 saw Australia overtake Spain as the world's second-largest exporter.

The US state of California is by far the world's top producer of almonds, but is currently struggling with its own prolonged drought. At her Plant Research Centre laboratory, Michelle Wirthensohn is looking for more ways to conserve water during almond production.

"As part of the breeding plan, we're trying to produce cultivars yielding even more with the same amount of water, so they're more water-use efficient," she said.

A recent SBS story on the almond industry featuring Michelle can be viewed here:

<http://www.sbs.com.au/news/article/2015/12/13/kernel-hope-drought-stricken-almond-farmers>

