

# The UWA Institute of Agriculture



Colleagues and friends gathered at The University Club of WA to celebrate Emeritus Professor Graeme Martin's enormous contribution to agricultural teaching and research during his career at UWA that has spanned more than five decades. Continued on page 5



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**

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## From the Director

**Making up for the time we lost and opportunities we postponed during the pandemic has been a clear priority for myself, my UWA colleagues and national and international collaborators over the past few months.**

It has been a delight to see the Western Australian agricultural community busier than ever with field days, workshops, crop walks, open days and more. On a personal note, the ability to travel overseas again has allowed me to reunite with many dear friends, fellow researchers and leaders. My recent trips to India, Canada, Malaysia, Esperance in WA – and Thailand next month – have seen me reacquaint myself with the joys of visiting collaborating universities and research institutes. After two long years of webinars and video calls, being able to welcome international visitors to our Crawley campus to meet face-to-face and tour research projects has been incredibly rewarding. Turn to pages 6, 14 and 18 to read more.

The UWA Institute of Agriculture has held numerous successful events in recent times, including the Lefroy Fellow Research Seminar (page 12), 16th annual Postgraduate Showcase (page 11) and our annual Industry Forum, which explored the topic 'Navigating the Global Agricultural Marketplace in the Indian Ocean Rim: Spotlight on India and Indonesia' (page 7).

While there are many achievements and research successes for the Institute to celebrate in this newsletter, we have also experienced great loss. We bid farewell to UWA Senior Research Fellow Dr Rodger Boyd (page 6) and UWA Honorary Research Fellow Michael (Mick) Poole AM (page 14). Both men contributed a great deal to this university, and agricultural research in WA and beyond. They will be dearly missed.

### **Hackett Professor Kadambot Siddique**

AM CitWA FTSE FAIA FNAAS FISPP FAAS FPAS  
kadambot.siddique@uwa.edu.au



Professor Sangwan and his team with UWA academics and heads of schools.

**“The first batch of students from India are expected to join UWA by end of this year.”**

## UWA-India joint PhD program to bear fruit

**The long-time partnership between UWA and the Academy of Scientific and Innovative Research (AcSIR) was further fortified when AcSIR visited The UWA Institute of Agriculture last month.**

The Institute's Director Hackett Professor Kadambot Siddique and AcSIR Director Professor Rajender Singh Sangwan made history earlier this year when they launched the first-ever joint PhD program between UWA and an Indian research institution.

Professor Sangwan and his team travelled to Perth from Uttar Pradesh to finalise details of the new joint PhD program.

Professor Siddique said the group enjoyed a very productive meeting, which was followed by a welcoming dinner at his home.

“The first batch of students from India are expected to join UWA by end of this year,” he said.

“I look forward to this program creating new and exciting opportunities for science and technology innovation in both our countries.”

# WALRC promotes Ridgefield research

**The WA Livestock Research Council (WALRC) Study Tour was the perfect joint opportunity to learn first-hand about research underway at UWA Farm Ridgefield, acknowledge outgoing WALRC chair Dr Tim Watts, and celebrate his new role as Farm Manager.**

About 70 producers, consultants and researchers attended the West Pingelly event in June to hear presentations covering a wide range of research topics relevant to the lambing industry.

WALRC scholarship recipients Eloise Boland and Georgia Walsh from UWA presented their Masters research on heat stress, followed by UWA Professor Shane Maloney who expanded on the new 'Heat stress during joining' project led by UWA and funded by the MLA Donor Company.

UWA Associate Professor Philip Nichols presented on field trials as part of the Annual Legume Breeding Australia (ALBA) joint venture with DLF Seeds.

Dr Kevin Foster, a UWA Honorary Research Fellow working at DPIRD, demonstrated how to use the new Oestrogenic Subterranean Clover Guide

– which was a collaboration between The UWA Institute of Agriculture, DPIRD and the MLA Donor Company.

UWA PhD candidate Luoyang Ding fascinated the crowd with his investigations into Gut-Brain-Gene behaviour, and UWA Lefroy Fellow Dr Kelsey Pool presented on the effects melatonin during gestation had on twin-lamb production and welfare.

"Brilliantly organised to run smoothly from shearing shed to paddock, this tour followed ongoing research in animal production and cropping," Dr Pool said.

"The highlights for me were seeing our UWA Masters students talk about their research in sheep production and climate change out in the paddock, and tackling questions from industry, as well dinner to finish off the night and celebrate Dr Watts."



Emeritus Professor Graeme Martin addresses the Pinjarra SHS students.

## Down to earth Ridgefield excursion

**Getting their hands dirty and taking soil samples during an excursion to UWA Farm Ridgefield was a bonus learning opportunity for Pinjarra Senior High School students.**

Emerita Professor Lynette Abbott and Emeritus Professor Graeme Martin recently took the Year 11 and 12 General Plant Production students on a bus tour around the Pingelly farm.

Professor Abbott asked the group to take samples from an area of the farm that was scalded from salt, analyse the chemical and physical properties of the soil, and then send the results back to her.

"We went from paddock to paddock to look at the projects and experiments they have done to see what works best for each of the different soil types," student Sydney Lucas said.

Student Jaxon Fiori was particularly interested in Professor Philip Vercoc's perennial shrub research trials.

"The native plants, including saltbush, have been used to help stop erosion and repair saline soil," he explained.

While the excursion was a serious educational opportunity, there were still plenty of laughs along the way.

"The funniest part of the day was the leaping alpacas running towards us when we were in the bus," Sydney said.



Luoyang Ding, Professor Shane Maloney, Dr Meredith Guthrie, Dr Serina Hancock, Dr Hayley Norman, Dr Kelsey Pool, Associate Professor Dominique Blache and Dr Kevin Foster at UWA Farm Ridgefield. Photo: WALRC via Serena Kirby





Field trials in the NPZ-UWA canola breeding project at Kojonup, Western Australia, in 2019.

Below: Members of the NPZ-UWA canola breeding team at the UWA Shenton Park Field Station in 2019; NPZ Senior Canola and Pulse Breeder Dr Olaf Sass, NPZ Australia Pty Ltd Company Secretary Dean McKenzie, UWA Senior Technician Rozlyn Ezzy, UWA Professor Wallace Cowling, UWA Technical Operations Manager Jasenka Vuksic and NPZ International Development Manager Yves Devisme.



# Two decades of NPZ-UWA canola breeding partnership

**Norddeutsche Pflanzenzucht  
Hans-Georg Lembke KG (NPZ)  
and UWA recently celebrated  
20 productive years of partnership  
in canola breeding and research.**

NPZ is a family plant breeding company based in Germany with a 125-year history and is now a world-leading canola breeding company that releases winter and spring canola hybrids for key global seed markets.

Canola pre-breeding at UWA has been supported by NPZ since 2002 and has resulted in more than 37 valuable commercial canola cultivars for Australian farmers.

These canola varieties have contributed to development of the Australian canola industry from a small unreliable crop in 2001 to the third-most valuable crop in Australia in 2021, when more than six million tonnes were harvested in Australia.

Initially, NPZ and UWA were partners in Canola Breeders Western Australia Pty Ltd (CBWA) together with the Grains Research and Development Corporation and the Council of Grain Grower Organisations Ltd.

CBWA was formed in response to a growing demand by farmers for improved canola varieties adapted to local conditions.

In 2013 the CBWA breeding program was purchased by NPZ and new varieties were released subsequently through NPZ's commercial license partners in Australia (BASF, Seed Force, and Pioneer® Brand Seeds) as well as partners in South Africa.

The UWA Institute of Agriculture Associate Director Wallace Cowling said NPZ had also been a strong supporter of teaching and research training in plant breeding at UWA.

"Research projects sponsored by NPZ at UWA have funded a high proportion of my salary and provided valuable training

for UWA postgraduate students and staff, several of whom have gone onto successful careers in industry and academia," Professor Cowling said.

Of the 37 major canola varieties released in Australia, 28 were hybrids including the world's first triazine tolerant (TT) canola hybrid 'Jardee', released in 2008.

"These varieties have had a major impact on the Australian canola production especially through the transition of the important TT herbicide segment to more productive, stable and disease tolerant hybrids," Professor Cowling said.

"The Australian canola industry continues to grow in production and value, and UWA and NPZ can be proud of their role in helping this growth."

**Professor Wallace Cowling**  
wallace.cowling@uwa.edu.au

# Outpouring of love and gratitude for UWA legend at 50th anniversary symposium



Symposium attendees on stage at the University Club of WA main auditorium.

**When he looked out over the sea of faces gathered to celebrate his five-decade milestone of teaching and research at UWA, Emeritus Professor Graeme Martin admits to feeling a little overwhelmed.**

The UWA Institute of Agriculture and the UWA School of Agriculture and Environment jointly held a special symposium in July to mark Professor Martin's significant career and contributions at the university.

"I went into this event with a mix of warmth and trepidation," he said.

"Warmth because of the effort being made on my behalf by people I cherish ... trepidation because I do not like to be the centre of attention."

"I was afraid of embarrassing stories and that I would shed tears. Which I did, on several occasions," said Emeritus Professor Graeme Martin.

The welcome address was delivered by UWA Deputy Vice-Chancellor (Research) Professor Anna Nowak, during which she fondly recalled her first email interaction with Professor Martin that he ended: "Best wishes, cynical old man".

"I believe you should change your email signature from 'cynical' to 'wise'," Professor Nowak said.

"If wisdom is the ability to contemplate and act using knowledge, experience, understanding, common sense and insight – I think that would be a much more fitting sign-off."

Kicking off the event was Dr David Masters, who traced Professor Martin's roots growing up on a sheep and cereal farm to his many decades teaching and researching reproduction, livestock, and agricultural sciences at UWA.

**"I was afraid of embarrassing stories and that I would shed tears. Which I did, on several occasions."**

Professor Alan McNeilly joined the event via live video from Scotland to speak about Professor Martin's post doctorate adventures in Europe.

Professor Steve Walkden-Brown, Dr Maria Hötzel, Associate Professor Dominique Blache and Associate Professor David Miller then covered the many aspects of his research into sheep reproduction in the 1990s.

Following Dr Penny Hawken and Dr Trina Jorre de St Jorre, who talked about 'Social sheep', Dr Irek Malecki and Dr Judy van Cleeff explored Professor Martin's emu research achievements.

Sheep Worm Team members, Dr Johan Greeff, Dr Shimin Liu and Shamshad Ul Hassan, then spoke on worms, flies, and the immune system.

Professor Martin said he was surprised by the sheer number of people who attended the event, which struck him as overwhelming when he stood on-stage to present his right of reply.

"As the symposium progressed, with warm messages from people I cherish as colleagues and friends, I reflected over my 50 years at UWA and came to the realisation that my most important contribution was to the personal development of postgraduate students," he said.

"This became crystal clear when international students Shoaib Khan and Suyog Subedi spoke, right at the end of the program.

"Their heartfelt words brought tears to my eyes and made me reflect on the 40 or so little pockets of positive influence that I have scattered around the world. It was very humbling."

Professor Martin said he was very thankful to his most cherished friends and colleagues from over the decades who helped organise the event.

"Together, they had a lot of dirt on me but, thankfully, there were not too many embarrassing stories," he said.



# Pioneer of barley research remembered

**UWA Senior Research Fellow Dr Rodger Boyd was a pioneer of barley research and breeding who passed away in August. Dr Boyd's research and teaching career at UWA spanned more than four decades. He supervised many postgraduate students, including The UWA Institute of Agriculture Honorary Research Fellow Tanveer Khan. In his own words, Professor Khan fondly memorialises his dear colleague and friend.**

I still remember that 6 April 1965 when I was ushered into his office, only to find him busy fixing his shoelaces. Once that important shoelaces job was finished, we started on what was my life-changing association with Rodger that lasted until his retirement from UWA. I believe I was the first student to successfully complete the PhD thesis under his supervision.

Rodger encouraged full freedom to develop the PhD program once key elements of the subject matter were decided, and that helped us to explore the subject widely and in a comprehensive way adding value to our training.

Rodger was incredibly hard working and collaborative and as a result in a very short space of time he had a wide network in WA as well as across Australia. When I started with him, he already had established a field research infrastructure at a farmer's property

in Trayning, collaborations in cereal breeding with the Department of Agriculture and a good number of postgraduate students. He was always available to his students and extremely supporting in all matters. I can't recall any student who failed to complete his studies under his supervision. He was very keen to find any opportunity to help his students travel to eastern states that helped to broaden our horizons and appreciate the wider agricultural landscape of the continent.

Rodger was very focussed on the ultimate client of our research: the farming community. I learned this important lesson by working with him as his student and it benefited me throughout my career in focussing my research. A few years ago, I was talking to one of his former students Dr Jana Janakiram who, despite doing a PhD in plant breeding, became a very

important extension worker in Canada. He told me that the key to his success in extension work was to keenly observe the way Rodger communicated with farmers.

Rodger did not see plant breeding in isolation and had strong interest in the environmental component of the genotype-environment interaction. He ventured out wider to explore how this understanding can help the outcome of plant breeding.

Rodger will be remembered for his contribution to teaching plant breeding, in particular germplasm improvement of barley, but above all for his communication skills.

**A memorial for Dr Boyd was held at the University Club of WA in September.**

## Director makes impact in India

**When the pandemic froze international travel for two years, The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique built up a very eventful itinerary for his recent trips to India.**

At a field visit to Ujwa Krishi Vigyan Kendra in Delhi, Professor Siddique met with researchers and extension specialists engaging in innovative technologies to adapt climate change and increase farmers' income.

This is part of a joint project between UWA, Amity University, the Kernel Foundation Bangladesh, and Kabul University, funded by Asia Pacific Network for Global Change Research.

He also delivered two lectures at Amity University (AU) and discussed the ongoing productive collaboration between AU and UWA.

During two visits to the ICAR Indian Agricultural Research Institute in New Delhi, Professor Siddique delivered two lectures and was pleased to meet with staff and postgraduate students to discuss future projects and strategies.

He also participated in a research project meeting on 'Mainstreaming of sesame genetic resources through trait discovery', which is funded by Department Biotechnology India.

The National Agri-Food Biotechnology Institute and the Center of Innovative and Applied Bioprocessing organised an international workshop on 'Crop

Improvement Through Genome Editing', at which Professor Siddique presented a talk.

Professor Siddique met with UWA partners and educational agents based in Kochi, Kerala for a discussion about the increasing interest in studying at overseas universities among young locals.

"Coming out of COVID-19 isolation, it was so pleasing to engage with our valued stakeholders and UWA partners network in India," he said.

"UWA is keen to grow business and research success in India, in collaboration with our partners."

Hackett Professor Kadambot Siddique (middle) with higher education agents in New Delhi.



# Timely topic prompts big picture perspectives at Industry Forum

**Taking place just a few weeks after newly-elected Australian Prime Minister Anthony Albanese emphasised that India and Indonesia offered 'enormous economic opportunities', The UWA Institute of Agriculture's 2022 Industry Forum had its finger firmly on the pulse of geopolitics and trade.**

Farmers, industry members and academics gathered at The University Club of WA for the 16th annual event to explore the theme 'Navigating the Global Agricultural Marketplace in the Indian Ocean Rim: Spotlight on India and Indonesia'.

In his opening address, Deputy Leader of the Opposition The Hon. Colin de Grussa MLC said the topic could not have been more timely.

"Given the numerous developments happening with our near neighbours, it is very appropriate we have this discussion today," Mr de Grussa said.

UWA Professor Stephen Smith, who chairs the UWA Public Policy Institute Advisory Board and sits on the board of the Perth USAsia Centre, captivated the audience with his keynote presentation.

Professor Smith expertly set the scene by explaining the current geopolitical climate, where Australia was positioned strategically, and how that can work in the best interests of the State and national agricultural industry.

"The single most important thing that Australia can do – in terms of its place in the world, its security and prosperity – is to grow our economic trade, investment and economic relationship with these countries to a much higher level," he said.

"I have tried to shine a spotlight on these countries since I first became Foreign Minister back in 2007."



Brad Wooldridge, Hackett Professor Kadambot Siddique, Jules Alvaro, The Hon. Colin de Grussa MLC, Eliza Borrello and Professor Stephen Smith at the 2022 Industry Forum.

Delivering his presentation from India via video, technology strategist Deepak Pareek explored how India was unlocking its potential in agriculture to become the food capital of the world.

Drawing on his experience as chief executive of agriculture market intelligence firm AgriWatch, Mr Deepak emphasised digital and technological advancements that would improve India's agricultural market potential.

WA grain grower Jules Alvaro, the director of a broadacre business in Nokaning who sits on the Muresk Institute Advisory Committee, used her lived experience and on-farm photography to demonstrate her unique perspective on the topic.

Austrade Senior Trade and Investment Commissioner Sally Deane presented her video from Jakarta to explain what WA farmers and industry could be doing to enhance the current state of Australia's trade relationship with Indonesia.

The final speaker of the afternoon was Arthur River and Kalgan farmer Brad Wooldridge, who promised a "controversial ride" in discussing the pressures growers were under to balance productive output with increased restrictions and roadblocks.

"The new Commonwealth Government has made it very clear it wants to engage more ferociously with India and Indonesia."

**Professor Stephen Smith**

ABC national regional affairs reporter Eliza Borrello then took to the stage to facilitate a rousing panel discussion which Mr Deepak and Ms Deane joined live from their respective countries.

Afterwards, attendees gathered in the terrace for a well-earned networking sundowner.





Left: Crimson Seedless table grapes on the vine.

Below: Sam Salo celebrating submitting his thesis with supervisor Associate Professor Michael Considine.



# Unpacking grapevine leafroll disease at the molecular level

## Switching his research focus from human to plant diseases undoubtedly bore fruit for UWA PhD candidate Wisam (Sam) Salo.

The accomplished molecular biologist from Iraq submitted his thesis earlier this year, which explored the impact of virus effects on table grape quality.

Mr Salo's principal supervisor, The UWA Institute of Agriculture theme leader Associate Professor Michael Considine, said the molecular mechanism of the effects of virus on fruit quality was not previously known.

"His work built on earlier findings that Grapevine Leafroll-associated Viruses (GLRaV) can influence berry size and colour in table grape," Professor Considine explained.

Grapevine leafroll disease caused by GLRaVs can devastate vine production in table and wine grapes – decreasing yield, delaying ripening, and decreasing berry quality.

Viral diseases are particularly devastating in horticulture and perennial tree crops, as the virus cannot be eradicated non-destructively.

For his research, Mr Salo drew on an experimental set of vines (cv. Crimson Seedless) first established by DPIRD in the early 2000s.

The set included uninfected vines, vines infected with one strain of virus only and vines infected with a mixture of viruses that were all known to be present in WA vineyards.

Berries of infected vines clearly showed delayed ripening, increased berry size and were less able to achieve desirable colour than the uninfected control vines.

Mr Salo established that 'viral load' (the copy number of each virus) had no relationship on berry quality.

This finding could assist with the development of diagnostic tests to predict incidence of grapevine leafroll disease.

Professor Considine said Mr Salo then took his research "to the next level and then one beyond it" by investigating changes in mRNA and small RNA (miRNA).

"He found broad agreement in the signatures of these molecular profiles," he said.

"This implicates the activation of specific groups of miRNA by viral infection, which then target mRNA genes responsible for hormone synthesis.

"In this way, the virus causes a dysregulation of hormone function during ripening, which explains the delayed ripening, lack of colour and enlarged berries."

### Dr Wisam Salo

wisam.salo@research.uwa.edu.au



For more than 10 years, there has been a global search for a trout strain that will enable aquaculture to continue as water temperatures increase.



Dr Craig Lawrence in the Aquaculture Facility at the UWA Shenton Park Field Station. Credit: Community Newspaper Group

# Global warming-resilient rainbow trout offers hope

**An international team of researchers from UWA, the University of British Columbia and Harvard University have shown that an isolated Western Australian trout population may offer aquaculture and recreational anglers a solution to global warming.**

The UWA School of Agriculture and Environment Dr Craig Lawrence said aquaculture and wild fish stocks had experienced losses due to global warming.

"This is particularly important for rainbow trout, which are farmed worldwide, but considered a cold-water species only suitable for water temperatures between 5°C and 20°C," Dr Lawrence said.

For more than 10 years, there has been a global search for a trout strain that will enable aquaculture to continue as water temperatures increase.

Unlike elsewhere in the world, an unusual trout population from Pemberton in Western Australia has thrived despite increasing water temperatures.

Their ancestors were introduced to WA for aquaculture and recreational stocking where they have been isolated for more than 25 generations.

At the Pemberton hatchery, summer heatwaves over the past 50 years have unintentionally selected for fish with impressive upper temperature limits.

"In this study, we raised groups of trout at six different temperatures ranging from 15°C to 25°C," Dr Lawrence said.

"Typically, to understand how fish cope with increased temperature, scientists focus on one or a few measures, such as growth or upper temperature limit, in a single study.

"But in the most comprehensive study to date, we looked at how temperature affected the growth, energy it takes to digest a meal, physical fitness, upper temperature limit, ability to withstand low oxygen, and heart rate of these fish."

The study showed that almost every aspect of the performance of the rainbow trout peaked in the groups of fish raised at 17-23°C.

At these temperatures, fish had the best growth, used the least energy to digest food and were the most physically fit.

The fish could even endure temperatures up to 31°C before losing balance (which is how scientists typically measure a fish's upper thermal limits).

Dr Lawrence said this was an incredible feat, given that rainbow trout from elsewhere in the world do best below 20°C.

"With a combination of artificial and natural selection, the Pemberton rainbow trout have given us a bit of hope for the future of aquaculture in a warming climate," he said.

**Dr Craig Lawrence**  
craig.lawrence@uwa.edu.au

# OPEN DAY

## opens up a world of opportunity

**Planning the UWA Shenton Park Field Station 2022 Open Day while juggling his final semester at university was equal parts rewarding and challenging for aspiring regional reporter Guanhao Cheng.**

The UWA Institute of Agriculture and UWA School of Agriculture and Environment have joined forces to host the multipurpose research facility's first public open day in almost 10 years.

When the big day arrives on 23 September, Event and Communications Officer Mr Cheng said visitors will be able to get up and personal with many innovative UWA projects.

"I think anyone who wants to make a splash in science will find it valuable to see the kind of work that leads to real world changes and informs practises that shape government and industries," he said.

"It's a great opportunity to pick the researchers' brains and learn more about all the great agricultural and environmental research that are happening right on our doorstep.

"If this event captures the inklings of enthusiasm stirring in attendees who are excited about science and see a future in something they learned on the day, then I think I will feel very fulfilled."

Over the past couple of months, Mr Cheng has been working with UWA colleagues to rally volunteers, organise catering, promotional materials, and getting researchers on board with presenting their work.

Mr Cheng said he decided to major in Journalism and Creative Writing because he has always had a fascination with language and telling stories.

"I grew up in an immigrant household where the realities of a language barrier have always been apparent to me," he said.

"It made me very familiar with the importance of effectively communicating to people and there is a quiet satisfaction in successfully bridging that gap."

In this role, Mr Cheng said he felt very fortunate to be engaging with the agricultural research and farming communities in WA.

"My family on my father's side were (and still are) farmers, so there's a bit of family history there," he said.

"However, growing up in Perth and hearing about how farming is like back in rural Guangzhou, it's like seeing two different worlds.

"The amount of science that goes into the farming practises here is just mind-blowing. It helps that agriculture is one of the economic powerhouses that defines WA, so there will likely always be big and gripping stories to be discovered."

"When something I create or contribute to something that makes an impact and gets people talking, it's an amazing feeling."

UWA Event and Communications Officer Guanhao Cheng.



## Survey seeks WaterSmart Dams insight

**What are the damning issues WA growers are facing with their dams and farm water storage?**

UWA Associate Professor Nik Callow is encouraging growers to share their on-farm water storage issues and interest in WaterSmart technologies through an online survey.

Results from the survey will be used to inform the direction of the two-year WaterSmart Dams project led by the Grower Group Alliance (through the South-West WA Drought Resilience Adoption and Innovation Hub) with collaboration from DPIRD and UWA.

The project involves 12 core demonstration sites, building farm-based water planning tools, workshops, field days and industry training.

Professor Callow said UWA welcomed the opportunity to partner with the GGA and DPIRD for work that would significantly benefit WA farmers.

"Knowledge and water planning tools are demanded by farmers who need their dams to work in all years, and they need to be able to make water investment decisions with confidence," he said.





Emerita Professor Lynette Abbott, Professor Anna Nowak, Emeritus Professor Graeme Martin and Hackett Professor Kadambot Siddique with the student presenters.

# Next generation of UWA researchers shine

**The importance of early-career researchers at UWA was the focal point of Acting Deputy Vice-Chancellor (Research) Professor Anna Nowak's stirring address at The UWA Institute of Agriculture 2022 Postgraduate Showcase in June.**

"There are many ways of measuring success ... when we consider our highly cited authors and research funding success, many of our celebrated academics have roots in the Institute," Professor Nowak told the 80-strong audience.

"We can also look at the many PhD students – being immersed in an environment of excellence and with opportunities like today to discuss and present their work with leading researchers."

Under the mentorship of Emeritus Professor Graeme Martin, six of UWA's best and brightest postgraduate students in agriculture and related areas presented their research at the 16th annual event.

First session chair CSIRO scientist and the Institute's Industry Advisory Board member Dr Hayley Norman introduced Md Khairul Islam from the School of Allied Health.

Mr Islam's project, funded by the CRC for Honey Bee Products, explored the use of High-Performance Thin-Layer Chromatography as a novel approach for analysing different varieties of WA honeys.

The UWA School of Agriculture and Environment (SAGe) PhD candidate Tanushree Halder then discussed her research aim to unravel the genetics of wheat root system architecture.

Third speaker Joe Gebbels from SAGe, who also works as a program manager at Meat & Livestock Australia, expanded on his recent findings that improving productivity reduces methane intensity but increases the net emissions of sheep meat and wool enterprises.

Following the afternoon tea break, second session chair UWA Emerita Professor Lynette Abbott introduced Sajeevee Sarathchandra from SAGe.

Soil scientist Ms Sarathchandra presented her research on remediating iron ore mine tailings by growing perennial ryegrass with organic amendments.

Having recently submitted her PhD thesis, Bhagya Dissanayake from the ARC Centre of Excellence in Plant Energy Biology and School of Molecular Sciences was pleased to discuss her success in uncovering the hidden adaptations of bread wheat roots under salinity stress.

The final speaker of the afternoon was Isobel Sewell from the School of Biological Sciences and UWA Oceans Institute, whose project at the Shenton Park Field Station investigated the use of black soldier fly protein in freshwater aquaculture diets.

**"The Institute demonstrates a critical mass that is contributing strongly to UWA, to our next generation of researchers, to our community, and to the world."**

**Acting DVCR Professor Anna Nowak**

Acting UWA DVCR Professor Anna Nowak.



# Future planning and pizza on the menu at Careers Night

**The room was buzzing with opportunity and excitement at The Ag Institute Australia (WA Division) Careers Night in August.**

The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique was happy to network with dozens of attendees about their next steps towards study and research at UWA.

Professor Siddique was joined by fellow university representatives, research institutions and prospective employers at the informal even held at The Royal Agricultural Society of WA.

"The evening provided an opportunity for students and graduates to speak leading agricultural organisations about future employment, vacation work, scholarships or ongoing education," he said.

"It was my pleasure to meet and talk to students from various universities and high schools and industry representatives."



Hackett Professor Kadambot with students at the annual Careers Night.



Dr Kelsey Pool delivering the Lefroy Fellow 2022 Research Seminar.

## Lefroy Fellow breaks new research ground

**After decades of believing that ovine clover disease was purely a ewe-oriented issue, the new discovery that rams are also affected was revealed at the UWA Lefroy Fellow 2022 Research Seminar in May.**

Lefroy Fellow Dr Kelsey Pool told the audience that her research team had demonstrated, for the very first time, that phytoestrogens alter ram reproductive function and provide evidence of a mechanism for this event.

"Our research shows that the phytoestrogens (plant-based compounds that mimic the hormone estrogen) associated with clover disease detrimentally impact sperm function in-vitro, reducing fertilising potential," Dr Pool said.

"In rams grazing oestrogenic pasture, reproduction was also reduced, however this effect is transient and does not persist to the following breeding season."

The E.H.B Lefroy Research Fellowship was established through a bequest by Sir Edward H.B. Lefroy and his family for post-doctoral candidates to undertake agricultural research at UWA.

The UWA Institute of Agriculture seminar was focused on research outcomes from the past 18 months of the Fellowship, including results from on-farm trials, multi-generational fly models and lab work across several institutes in WA.

Dr Pool also presented her research findings on how commercially available neurohormone (slow-release melatonin tablets) can impact twin-lamb survival.

Twin-born lambs have a 30 per cent mortality rate in the first 72 hours of life.

Following the research trial, Dr Pool found that lambs exposed to melatonin in utero had increased weight and brown fat, marking and weaning percentages, weight gain, learning ability, vocalisation, and behaved more inquisitive or bolder.

"The main take away from the research was that melatonin was having a physiological response," she said.

"The events that happen in utero or early life drive production outcomes and how they (lambs) navigate life into future years."

**Dr Kelsey Pool**  
kelsey.pool@uwa.edu.au

**"The main take away from the research was that melatonin was having a physiological response."**



# Livestock fertility headed to greener pastures

## What is the role plant pathogen *Phoma medicaginis* plays in producing phytoestrogen in annual *Medicago* species?

This question is being investigated by UWA PhD candidate Mahtab Omidvari, as part of a project team led by Professor Martin Barbetti at the UWA School of Agriculture and Environment.

One major issue for annual *Medicago* spp. is phoma black stem and leaf spot disease, a type of fungal infection caused by *Phoma medicaginis* that can increase phytoestrogens.

Phytoestrogens can negatively affect herbivore livestock fertility when exceeding animal risk threshold.

Mrs Omidvari looked for *Medicago* spp. varieties which are most resistant to phoma black stem and leaf spot disease and produce the lowest levels of phytoestrogens.

She also evaluated different environmental factors affecting phytoestrogen production in annual *Medicago* spp. infected with *Phoma medicaginis*.

The results showed that certain varieties of annual *Medicago* spp. may produce more phytoestrogens than others, even without *Phoma medicaginis* infection.

"Levels of phytoestrogens in annual *Medicago* spp. stems could range up to almost 2000 mg/kg for one of the most important phytoestrogens known as coumestrol," Mrs Omidvari said.

"There was up to a 30-fold increase in coumestrol from infection of *P. medicaginis*."

Mrs Omidvari said she hoped her research outcomes would help farmers know when and where they should leave their animals for safe grazing.

"The feeling of accomplishment with my studies is something that I cannot explain," she said.

"To contribute something novel, going from being a student to a candidate, finishing a new section of a paper and finally publishing it are some of the enjoyable experiences during my PhD.



UWA PhD candidate Mahtab Omidvari with annual *Medicago* in a UWA glasshouse.

Throughout her postgraduate journey at UWA, Mrs Omidvari said she had the freedom to think critically, investigate and collaborate.

"When I spend a lot of time struggling with some problems, I could not seem to figure out what the problem is," she said.

"Then I would decide to tackle one problem slowly but steadily, and finally I get the right answer."

**Mahtab Omidvari**

mahtab.omidvari@research.uwa.edu.au

**Mrs Omidvari said she hoped her research outcomes would help farmers know when and where they should leave their animals for safe grazing.**



## Vale Michael (Mick) Poole

**Heralded as one of the fathers of WA's modern-day canola industry, UWA Honorary Research Fellow Michael (Mick) Poole AM passed away this month.**

After graduating from UWA in the early 1960s, the passionate plant research scientist spent three decades working at the Department of Agriculture and Food (now DPIRD).

In 1994 he joined CSIRO to head its new Centre for Mediterranean Agricultural Research – which was his first of many leadership positions during 12 years at the research organisation.

Mr Poole published extensively on broadacre farming systems, including the competitive aspects of pasture establishment under crops, introducing new crops to the southern wheatbelt (particularly canola), the effects of waterlogging, weed competition and fertility build-up and rotations, and environmental impacts of new cropping systems.

"In regard to canola, I was there from day one," he told *Farm Weekly* in 2014.

"Around 1970, I was down in Esperance and a farmer there had a little patch of rapeseed growing, and I thought we could make a crop of this for the State, so for

the next 10 years I spent most of my effort working with canola to get it suitable for our environment."

After retirement, Mr Poole accepted honorary research positions at CSIRO and the UWA School of Agriculture and Environment.

One of his more recent achievements was assisting UWA with its successful bid for the CRC for Honey Bee Products.

He also was appointed as Chairman of the Board of WA Biodiversity Science Institute and sat on the Board of the Swan River Trust for many years.

For his significant contributions to the advancement of agricultural and environmental science as a leader, researcher and adviser, Mr Poole received many medals and honours, including Member (AM) of the Order of Australia, and fellowships to the Academy of Technology and Engineering, and Agricultural Institute of Australia.

## Capacity building workshop on climate smart agriculture

**Farming in developing countries is extremely vulnerable to climate change.**

The negative effects of climate change are felt in the form of weather variability and more frequent extreme weather events.

There is an urgency to develop new adaptive approaches of agriculture to address this challenge.

To equip agricultural extension agents with new knowledge and insights on climate change adaptation, The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique and Agribusiness Ecosystems theme leader Dr Amin Mugeru served as Master Trainers for a workshop at Amity University in Uttar Pradesh, India.

The international training program, part of the Asia-Pacific Network (APN) for Global Change Research Project, was organised and coordinated by Amity Food & Agriculture Foundation Director General Professor Nutan Kaushik and opened by Amity University Vice-Chancellor Professor Balvinder Shukla.

The hybrid event model meant that Amity University attendees interacted with virtual participants from different government and



Hackett Professor Kadambot Siddique and Dr Amin Mugeru with fellow workshop trainers and leaders from Amity University, Kernel Foundation, the World Bank, the Food and Agriculture Organization, Kabul University and more.

private organisations in India, Bangladesh and Afghanistan.

In his address, Professor Siddique emphasised the need for urgency to develop new adaptive approaches of agriculture to address the climate change challenges faced by smallholder producers.

"This should go together with promoting training of farmers by providing them with appropriate skills and knowledge to address their challenges," he said.

Dr Mugeru spoke about economic policy considerations for climate smart agriculture (CSA).

He emphasised the need to consider trade-offs when making choices on climate smart policies to promote and their overall welfare effect.

"The training workshop offered space for extension agents to share good CSA practices supporting sustainable agriculture in their countries," Dr Mugeru said.

"The lectures generated robust discussions on the need for context-specific climate smart agricultural practices to contribute to environmental sustainability, incentives and financial issues to help farmers adopt CSA practices, the need to prioritise CSA technologies to promote, and challenges in implementing CSA policies."

**Dr Amin Mugeru**

Amin.mugeru@uwa.edu.au



Modesto Lopes and head of MAF Extension Department Antonio Lay visiting the shallot farmer group in suku Ritabou, Bobonaro.



# COVID-19 impacts on smallholder households in Timor-Leste

**Smallholder farmers in Timor-Leste experienced significant harvest loss, labour shortages and income decline due to COVID-19 related market closures and movement restrictions.**

UWA School of Agriculture and Environment adjunct research fellow Dr Pyone Myat Thu and UWA alumni Modesto Lopes led a qualitative research project as part of ACIAR's Alumni Research Support Facility.

Mr Lopes is the National Program Manager for TOMAK, an agriculture and nutrition program supported by the Australian Government in Timor-Leste.

Timor-Leste was sheltered from the COVID-19 pandemic before recording its first case of infection in March 2020.

The government swiftly imposed strict lockdown measures, including 'sanitary fences' between municipalities and home confinements.

The research was conducted across four municipalities in Aileu, Baucau, Bobonaro and Viqueque between August 2021 and February 2022.

Data was collected in collaboration with local researchers and extension officers from the Timor-Leste Ministry of Agriculture and Fisheries.

A total of 124 smallholder farmers (56 per cent men and 44 per cent women) along with village leaders were surveyed to

capture perceived effects of COVID-19 related restrictions.

Dr Thu said all survey participants stated they were unable to sell their produce because of enforced marketplace closures.

"They drew on alternative strategies, such as setting up stalls on the side of roads and selling their produce directly from home to buyers," she said.

About half of respondents reported income losses, and 18 said they had no income at all as compared to the pre-pandemic period.

Nearly half of the surveyed farmers reported a harvest loss due to delays arising from movement restrictions, particularly for farmers whose fields were far away, and 12 per cent said they could not mobilise communal labour to plant, weed and harvest crops.

Environmental threats, including two major floods as well as pests and diseases (fall armyworm and African Swine Fever) compounded the impacts of the pandemic.

While the national Food Basket program (Cesta Básica) has been successful as a short-term economic recovery initiative to support local producers and traders and provide food aid to the Timorese population, Dr Thu said long-term resilient agrifood systems needed to be established.

"This will require addressing multiple hazards and their interconnections, which impact on smallholder livelihoods, through integrated climate-smart agriculture approaches," she said.

## Flux tower on the cards for Catalina

**UWA Research Fellow Caitlin Moore is one step closer to achieving her goal of multiple carbon and water monitoring flux towers across diverse WA climate zones.**

In February, Dr Moore from the UWA School of Agriculture and Environment joined The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique and Professor Wallace Cowling on a visit to Catalina Farms in Coorow.

Catalina Farms' Managing Director Rod Birch, who sits on the Institute's Industry Advisory Board, gave the group a tour of the property located about 280km north of Perth.

Top of the agenda was discussing plans of where and when to install the flux tower.

Once complete, Dr Moore said it would be an ideal companion to the OzFlux tower at UWA Farm Ridgefield in Pingelly to better understand landscape dynamics in the WA grainbelt.

"The aim is to measure carbon and water cycling from a cropping system in a lower rainfall, warmer northern climate zone compared to Ridgefield," she said.

"This will enable us to understand how cropping system productivity and water-use efficiency are responding to climate variability across a more diverse climate range in WA's southwest cropping region.

"I would love to have multiple flux towers at many more representative climate zones across southwest WA. Installing a new tower at Rod's property is an important step forward."

Hackett Professor Kadambot Siddique, Daniel Birch, Rod Birch and Dr Caitlin Moore.



# Sweet success for smart beehive monitoring system creator

**A smart beehive monitoring system designed using artificial intelligence by UWA PhD candidate Omar Anwar is creating plenty of buzz.**

School of Electrical and Electronic Engineering student Mr Anwar, who presented at The UWA Institute of Agriculture's 2021 Postgraduate Showcase, last month won Research & Innovation Project of the Year at the INCITE Awards.

He also recently bee-dazzled judges at the inaugural AgriFutures BeeTech Challenge in Sydney, pitched to key industry stakeholders at the Australian Bee Congress and was selected to present to potential investors at evokeAG 2023 in Adelaide.

"I believe that this research has a significant commercialisation potential, and hopefully this award can help us get the right kind of funding to carry it forward," he said.



UWA PhD candidate Omar Anwar receiving the Research & Innovation Project of the Year at the INCITE Awards.

Mr Anwar's smart hive solution Apis Prime™, which was developed in collaboration with the CRC for Honey Bee Products, uses a unique set of sensors to collect data from inside a hive.

Having recently submitted his PhD thesis, he is now working on further improving the design of the system.

"Hopefully this can be used as a launch pad for a start-up focused on developing beehive monitoring system for Australian market," he said.

"The challenges of pollination in Australian agriculture are very unique, but that also provides us with unique opportunities."

## Enthusiasm abounds for UWA research and study at Dowerin

**Crowds may have been lower than expected at the Dowerin GWN7 Machinery Field Days this year, but spirits were high as ever at The UWA Institute of Agriculture stall.**

The Institute's Associate Director Professor Phil Vercoe, Professor Megan Ryan, Master's student Miranda Slaven and Communications Officer Guan hao Cheng manned the Institute's stall within the Department of Primary Industries and Regional Development (DPIRD) shed.

The team were delighted to greet a mix of UWA graduates, current students and other visitors who were drawn in by the vibrant and engaging display.

The stall featured information on the UWA Farm Ridgefield's Best Practice Farming Systems (BPFS) Project, new pathways for prospective students to study agricultural science at UWA, Emerita Professor

Lynette Abbott's recently launched SOILHEALTH app, the MLA and UWA BeefLinks partnership project and more.

Throughout the two-day event, visitors were especially interested in learning what research would be on show at the upcoming Shenton Park Field Station Open Day on 23 September.

The Hon. Minister for Regional Development, Agriculture and Food and Hydrogen Industry Alannah MacTiernan MLC made an early appearance in the DPIRD shed.

Ms MacTiernan spoke with by the Institute's Honorary Research Fellow Dr Kevin Foster from DPIRD about his new ute guide for identifying harmful oestrogenic subterranean clovers in the field.

The guides, on display at the Institute's stall, proved very popular with farmers and researchers focused on sheep fertility.



Professor Megan Ryan and Professor Philip Vercoe at the Institute's stall.

UWA School of Agriculture and Environment graduates were well represented as both attendees and exhibitors at the ever-popular Field Days.

Wheatbelt Natural Resource Management Project Officer Millie Brady was hard at work promoting their project outcomes.

Ms Brady spoke to visitors about the benefits and importance of dung beetles in improving soil health, water uptake and pasture production.





Ben Stone and Leanne Brown from the Water Corporation visited PhD candidate Manish Sharma's glasshouse experiments with UWA researchers Evonne Walker, Professor Megan Ryan, Dr Bede Mickan, George Mercer and Andreas Pfeifle.

# Promising fertiliser from wastewater in the pipeline

## Could a recycled phosphorus (P) fertiliser derived from human wastewater known as 'struvite' be the next big breakthrough in agriculture?

For a project funded by the Department of Agriculture, Water and the Environment, UWA PhD candidate Manish Sharma is evaluating struvite's potential as a sustainable P fertiliser.

AW Howard Memorial Trust Tim Healey Memorial Scholarship recipient Mr Sharma said the essential nutrient P was primarily found in phosphate rock reserve – which is limited, non-renewable and will exhaust in next few centuries.

"There is an urgent need to explore new sustainable sources of P to meet growing demand," he said.

"Recycling of P from wastewater could be a long-lasting and sustainable solution."

Struvite is a crystalline compound of magnesium ammonium phosphate derived from recycled human wastewater via a precipitation process.

It contains significant amounts of macronutrients and small quantities of micronutrients.

Mr Sharma said the level of heavy metals and pathogens in struvite was lower than in commercial fertilisers, and therefore has a great potential to be used as an alternative P fertiliser.

"Due to its low solubility compared to commercially used P fertilisers, struvite also has significant environmental sustainability benefits by minimising the risk of eutrophication," he said.

Water Corporation conducted a pilot trial at their waste treatment plant, recovered some struvite and provided samples to Mr Sharma to test struvite's fertiliser value.

His first-year short-term glasshouse trial has produced promising results, suggesting that struvite has great potential as a substitute for soluble P fertiliser for the growth of chickpea and wheat.

These research findings will help Water Corporation to create a market for struvite in Australia.

"Recycling of P from wastewater could be a long-lasting and sustainable solution."

This year, Mr Sharma is comparing struvite with commercially used P fertiliser provided by CSBP Limited and growing crops to grain maturity.

"I hope that the findings from this project will have novel outcomes with industrial, environmental and commercial impact," he said.

Mr Sharma's PhD is supervised by Dr Sasha Jenkins, Hackett Professor Kadambot Siddique, Professor Megan Ryan and Dr Jiayin Pang.

**Manish Sharma**

manish.sharma@research.uwa.edu.au



Adjunct Associate Professor  
Chellapilla Bharadwaj.

## Chickpea breeder honoured with Eminent Scientist Award

**The UWA Institute of Agriculture Adjunct Associate Professor Chellapilla Bharadwaj from the ICAR-Indian Agricultural Research Institute was recently honoured with the Eminent Scientist Award at the sixth-annual Agrivision convention in New Delhi, India.**

The award was conferred by Vidyarthi Kalyan Nyas in collaboration with Indian Council of Agricultural Research (ICAR) in recognition of Dr Bharadwaj's research and scientific eminence in the field of plant sciences.

Minister of State for Animal Husbandry, Fisheries and Dairying Dr Sanjeev Kumar Balyan and ICAR Director General Dr T. Mohapatra presented the award.

Dr Bharadwaj has more than 20 years of experience breeding legumes and pulses, with a research focus on marginal and sub-marginal chickpea farming.

He has developed 17 high-yielding, climate-resilient chickpea varieties and is credited with developing the world's first marker-assisted bred chickpea variety for dryland areas.

**Adjunct Associate Professor  
Chellapilla Bharadwaj**  
drchbharadwaj@gmail.com

# Waiting was worth it for Indian PhD students

**After anxiously waiting for more than two years, finally stepping foot on UWA's Crawley campus was a dream come true for PhD candidates Sneha Priya Pappula Reddy and Agyeya Pratap.**

The students from India were left in limbo after being forced to put their travel and study plans on hold in early 2020 due to COVID-19 pandemic border closures and lockdowns.

Thankfully, their UWA supervisors helped enrol them as temporary offshore students so they could commence their postgraduate experiments at the Indian Council of Agricultural Research (ICAR)-Indian Agricultural Research Institute (IARI).

UWA has an ongoing long-term collaboration with IARI, which is a world-class agricultural postgraduate training and research institute in New Delhi.

Ms Reddy said it was an "ecstatic feeling" when her plane touched down on the Perth Airport tarmac earlier this year.

"Nothing on this earth has given me more contentment than to find myself walking joyfully on the campus of UWA each day."

Under the guidance of her supervisors, The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique, Professor Harvey Millar, Dr Jiayin Pang, Dr Bharadwaj Chellapilla and Professor Madan Pal, Ms Reddy has been busy analysing results from experiments she conducted at the IARI Phenomics Facility.

As part of her research to analyse chickpea genotypes when put under terminal drought stress, she has also performed proteomic (protein) analysis on chickpea drought samples shipped from India.

"I am looking forward to publishing my first article based on the experiments done in India," she said.

For his thesis, Mr Pratap is investigating the 'differential expression' of proteins in wheat varieties when put under increased heat stress during the reproductive period.

"The journey from New Delhi to Perth has been an amazing experience for me," he shared.

"UWA has treated me well and it has been a refreshing experience for me to be here. The facilities and instrumentation are truly state-of-the-art."



UWA PhD candidate Sneha Priya Pappula Reddy.



Agyeya Pratap has enjoyed exploring UWA.

Mr Pratap said he was thankful to his UWA PhD supervisors, Professor Siddique and Dr Nicolas Taylor, for being such supportive and attentive mentors.

"I have been able to progress a lot in terms of improving my data analysis and experiment design for making the most out of my PhD research," he said.

"My next step would be to do the proteomics for samples collected during the first experiment and start the second experiment."

**Sneha Priya Pappula Reddy and Agyeya Pratap**

sneha.pappulareddy@research.uwa.edu.au  
agyea.pratap@research.uwa.edu.au



## Awards and industry recognition

Name	Award
H/Prof Kadambot Siddique	Finalist for the WA Scientist of the Year – 2022 Premier’s Science Awards, Perth
H/Prof Kadambot Siddique	Lifetime Achievement Award – 2022 Asian PGPR International Conference for Sustainable Agriculture, Malaysia
Adjunct Associate Prof Chellapilla Bharadwaj	Eminent Scientist Award – 2022 Agrivision Convention, New Delhi
Omar Anwar	Research & Innovation Project of the Year – 2022 INCITE Awards, Perth
Dr Tsubasa Kawai	Young Researcher Award – Nagoya University
E/Prof Richard Hobbs	Honorary membership of the British Ecological Society

## New IOA appointments

Name	Title	Start date
Dr Lukasz Kotula	Honorary Research Fellow	30 June 2022
Dr Roopali Bhoite	Adjunct Lecturer	25 August 2022

## Visitors to IOA

Name of visitor	Visitor’s organisation and country	Host details	Date of visit
Former Federal Agriculture Minister the Hon. David Littleproud MP	The Nationals, WA	The UWA Institute of Agriculture	Thursday 28 April
Basit Ahmed Khan	Quaid-e-Azam University, Pakistan	Prof Nanthi Bolan H/Prof Kadambot Siddique Dr Zakaria Solaiman	Monday 6 June
AcSIR Director Prof Rajender Singh Sangwan and team	Academy of Scientific and Innovative Research (AcSIR) Uttar Pradesh, India	The UWA Institute of Agriculture	Friday 24 June
Prof Erica Donner	CRC for Solving Antimicrobial Resistance in Agribusiness, Food and Environments, WA	The University of Western Australia	Friday 29 July
Dr H Kamaluddin Abunawas Prof H Muhammad Khalifah Mustami Dr Hj Hasanah Amriana Hifazah	Alauddin State Islamic University Makassar, Sulawesi, Indonesia	The UWA Institute of Agriculture	Monday 1 August
Ambassador of Brazil to Australia His Excellency Mr Mauricio Carvalho Lyrio Honorary Vice Council Mrs Ester Steingieser	Consulate of Brazil, Australia	The UWA Institute of Agriculture	Tuesday 2 August
Mark Sumner Nick Clayton Hein De Villiers	Kalyx Australia, WA Mineral Magic, WA Crommelin AgriCoatings WA	The UWA Institute of Agriculture	Tuesday 9 August
Assoc/Prof Darunee Jothityangkoon Assoc/Prof Poramate Banterng Dr Sawitree Wongtangintharn Dr Sa-ngad Panyapruet	Khon Kaen University, Thailand	The UWA Institute of Agriculture and the UWA School of Agriculture and Environment	Wednesday 21 September
Parliamentary Secretary to Minister Alannah MacTiernan, the Hon. Darren West MLC	Department of Regional Development; Agriculture and Food; Hydrogen Industry, WA	The UWA Institute of Agriculture and the UWA School of Agriculture and Environment	Friday 23 September
Dr Mark Farrell	CSIRO, Australia	E/Prof Lynette Abbott	Tuesday 27 September

## New postgraduate (PhD) research students

Student name	Topic	School	Supervisor(s)	Funding body
James O'Connor	Food waste valorisation products as a nutrient source and carbon amendments	UWA School of Agriculture and Environment	Prof Nanthi Bolan H/Prof Kadambot Siddique Dr Bede Mickan A/Prof Matthias Leopold	University Postgraduate Award
Jessie Weller	Thesis topic to come	UWA School of Agriculture and Environment	Dr Matthias Leopold Assoc/Prof Sally Thompson	RTP Domestic Fees Offset
Luca Agostinelli	The neuronal mechanisms involved in the generation and modulation of episodic ultradian events in body temperature regulation	UWA School of Agriculture and Environment	Assoc/Prof Jennifer Rodger Dr Alexander Tang Assoc/Prof Domonique Blache	University Postgraduate Award

## Research grants

Title	Funding period	Funding body	Investigators
Differential solidification of steel slag to create a fertiliser co-product	2023	ARC Linkage Project	A/Prof Tom Honeyands Prof Brian Monaghan Prof Nanthi Bolan Dr Subhasish Mitra Dr Thi Bang Tuyen Nguyen Prof Geoffrey Evans Dr Damien O'Dea
How nutrition affects key life-history traits in humans including immune function, reproductive health, physical appearance, and healthy ageing	2023	Discovery Early Career Researcher Award	Dr Yong Zhi Foo
Linking phenotyping with genotyping to discover novel genes and QTLs regulating important root architecture traits in soybean germplasm	2022	UWA Research Collaboration Awards	Dr Yinglong Chen Dr Gustavo Boitt
Unlocking new genetic systems for hybrid breeding in wheat	2023	UWA Research Collaboration Awards	Dr Joanna Melonek Prof Ian Small
Parameter setting for plant growth for future space flight or Mars/Lunar installations	2023	UWA Research Collaboration Awards	Prof Harvey Millar
Implementing improved vineyard floor management for premium grape production in a warm and dry Mediterranean climate	2022-2023	Grower Group Alliance	Dr Joanne Wisdom Dr Nik Callow Dr Daniel Kidd Dr Caitlin Moore
Soil biological mechanisms underpinning the effects of biological amendments on soil health, productivity and resilience	2022-2025	Department of Agriculture, Water and the Environment	Dr Sasha Jenkins E/Prof Lynette Abbott Prof Nanthi Bolan H/Prof Kadambot Siddique A/Prof Marit Kragt Dr Zakaria Solaiman Dr Bede Mickan A/Prof Matthias Leopold Dr Louise Barton Ian Waite



# UWA IOA 2022 Publications

## Peer Reviewed Journals May to August 2022

Jha UC, Nayyar H, Parida SK, Bakir M, von Wettberg EJ and Siddique KHM (2022). Progress of Genomics-Driven Approaches for Sustaining Underutilized Legume Crops in the Post-Genomic Era. *Frontiers in Genetics* doi: 10.3389/fgene.2022.831656

Wingfield BD, De Vos L, Wilson AM, Duong TA, Vaghefi N, Botes A, Kharwar RN, Chand R, Poudel B, Aliyu H, Barbeti MJ, Chen SF, de Maayer P, Liu FF, Navathe, S, Sinha S, Steenkamp ET, Suzuki, H, Tshisekedi KA, van der Nest MA and Wingfield, MJ (2022). Draft genome assemblies of *Fusarium marasianum*, *Huntia abstrusa*, two *Immersiporthe knoxdavisiana* isolates, *Macrophomina pseudophaseolina*, *Macrophomina phaseolina*, *Naganishia randhawae*, and *Pseudocercospora cruentalis*. *IMA Fungus – F16* **13** doi: 10.1186/s43008-022-00089-z

Venugopalan VK, Nath R, Sengupta K, Pal AK, Banerjee S, Banerjee P, Chandran MAS, Roy S, Sharma L, Hossain A and Siddique KHM (2022). Foliar Spray of Micronutrients Alleviates Heat and Moisture Stress in Lentil (*Lens culinaris Medik*) Grown Under Rainfed Field Conditions. *Frontiers in Plant Science* **13** doi: 10.3389/fpls.2022.847743

Bao Y, Li X, Qi X, Wang X, Feng X, Chen Y, Hou L and Li M (2022). Analysis of cytokinin content and associated genes at different developmental stages in pak choi (*Brassica rapa ssp. chinensis* Makino). *Biotechnology and Biotechnological Equipment* **29** 788–797 doi: 10.1080/13102818.2022.2106888

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Jing J, Ga Wo, Cheng L, Wang L, Duan F, Yuan L, Rengel Z, Zhang F, Li H, Cahill JF and Jianbo Shen J (2022). Harnessing root-foraging capacity to improve nutrient-use efficiency for sustainable maize production. *Field Crops Research* **279** doi: 10.1016/j.fcr.2022.108462

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## UPCOMING EVENTS

### 2022 Hector and Andrew Stewart Memorial Lecture by Ian McClelland

Wednesday, 12 October 2022  
Bayliss Lecture Theatre, UWA

### Microplastics in the Environment lecture by Professor Meththika Vithanage

Monday, 31 October 2022  
Agriculture Lecture Theatre, UWA

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Editor: Rosanna Candler  
rosanna.candler@uwa.edu.au  
The UWA Institute of Agriculture  
+61 8 6488 4717 | ioa.uwa.edu.au  
The University of Western Australia M082  
Perth WA 6009 Australia

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