

The UWA Institute of Agriculture



Although she 'technically' retired 11 years ago, given her tireless research, mentoring and overall impact, you could be mistaken for assuming Emerita Professor Lynette Abbott is still employed at The University of Western Australia. Our very own stalwart of soil science celebrated an incredible milestone of five decades of research and service to UWA with a special symposium and garden party attended by more than 150 guests in mid November.

Continued on pages 6 & 7



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**

IN THIS ISSUE

- P5** AAAS FELLOWSHIPS IN THE FAMILY
- P9** VALE UWA LEGEND ALAN ROBSON
- P11** AQUACULTURE MAKING WAVES
- P13** SAFEGUARDING FAB A BEAN FUTURE
- P17** UWA HOSTS OZFLUX CONFERENCE

From the Director

We sometimes forget or disregard the importance of making time to properly celebrate our achievements and the important people in our lives.

I have supervised many PhD students over decades, but in all those years, we have never come together for an annual photo. This regret was rectified earlier this month when I met with the majority of current PhD students whom I am supervising or co-supervising at UWA. It was such a pleasure to capture this special moment in time. I look forward to the day when I will point out each of the talented individuals in this photograph and list their latest published papers, new jobs, awards, and all the successes that I am certain await their bright futures.

Only a few days after UWA lost a legend (and my mentor and dear friend) in former Vice-Chancellor Emeritus Professor Alan Robson (see page 9), we received news that Agricultural Sciences at UWA had earned 9th in the world and 1st in Australia according to the Shanghai Academic Ranking of World Universities 2024 (see below). What a tremendous achievement for the University. It is bittersweet to imagine just how proud he would have been, and once again – a fitting time to remind us to celebrate our wins when they come and cherish our loved ones always.

This month we bid farewell to Communications Officer Rosanna Candler for one year, as she embarks on a new career in parenthood. The UWA Institute of Agriculture warmly welcomes Ana Mendigutxia Balil in her place. Originally from Spain, Ana's most-recent role has been consulting with UNESCO International Institute for Higher Education in Latin America and the Caribbean. I look forward to working with Ana – and all the dedicated staff, researchers, and collaborators in our expansive network – throughout 2025. Thank you to all those who have helped make this year such a success. I wish you a very safe and happy festive season.



Hackett Professor Kadambot Siddique

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

Front cover photo:

Afternoon tea attendees celebrate Emerita Professor Lynette Abbott during the special symposium Grounded in Soil Science.



Hackett Professor Kadambot Siddique (front middle) with 26 of his current PhD students.

UWA Agricultural Science soars to new heights in global ranking

Agricultural Sciences at UWA is officially ranked top 10 in the world.

Its academic global ranking skyrocketed up 13 spots to ninth in the world and retained its number one position in Australia, according to the Shanghai Academic Ranking of World Universities 2024.

This position is the highest ranking UWA has achieved since Shanghai Ranking began publishing its Global Ranking of Academic Subjects (GRAS).

The GRAS rankings use a range of objective academic indicators and third-party data to measure the performance of world universities in respective subjects,

covering five major evaluation categories: world-class faculty, world-class output, high quality research, research impact and international collaboration.

The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique said there was no question that the Institute had contributed greatly to this outstanding accomplishment.

“Back when the Institute was re-established in 2006, I recall discussing with then-Vice Chancellor Professor Alan Robson that Agricultural Sciences at UWA

was not yet considered to be even top 40 in the world,” Professor Siddique said.

“For us to have climbed more than 20 places in less than two decades is truly remarkable.

“This global ranking – coupled with our long-held top position in Australia – is a timely reminder to celebrate the hundreds of talented and dedicated agricultural researchers, teaching and professional staff and students at this University and our collaborators.”

WA Governor Dawson explores fields of opportunity at UWA Farm Ridgefield



Extensive family histories of farming in Western Australia for both the WA Governor and his wife inspired many in-depth conversations about agriculture and food security during their recent visit to UWA Farm Ridgefield.

UWA Vice Chancellor Professor Amit Chakma and The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique welcomed His Excellency the Honourable Christopher Dawson AC APM, Darrilyn Dawson and their guests to the Pingelly farm in October.

The Dawson family have amassed five generations of farming – with the Governor’s great-great-grandparents arriving in the then Swan River colony as early colonial settlers in 1830.

Mrs Dawson, who comes from a long line of farming families in the southwest of WA, also provided her valuable perspective.

The group was led on a comprehensive tour of the farm and current on-farm research projects by Farm Manager Dr Tim Watts.

“It was clear that the Governor was both knowledgeable and extremely passionate about farming systems, regional communities, and the pressing issues of food security and production and climate change,” Professor Siddique said.

“These are important issues that researchers within the Institute and those actively involved in the UWA Best Practice Farming Systems Project at Ridgefield are working hard to improve and overcome.”

Following the tour, the Shire of Pingelly President Jackie McBurney and chief executive Andrew Dover joined for lunch at the Old Farmhouse.

Conversations about ways to engage Government with higher education and the agriculture industry to improve the future of farming, food, and the planet continued well into the afternoon.



The Governor and Professor Kadambot Siddique discuss the agricultural industry in front of a field of canola.

Senior members of the Pingelly Shire joined the group for lunch at the Old Farmhouse.



Nitrogen-fixing bacteria could ‘transform global agriculture’

There is now the real possibility potential of substituting synthetic nitrogen fertilisers with sustainable biological nitrogen fixation in every crop, according to agricultural scientist by training, author, inventor and entrepreneur Dr David Dent.

The UWA Institute of Agriculture and the Institute of Advanced Studies jointly hosted Dr Dent for a guest lecture titled ‘Fixed on Nitrogen: Challenging a Paradigm to Transform Agriculture’ in October.

Through his company Azotic Technologies Ltd, he has commercialised an invention based on plant intracellular colonisation by a nitrogen-fixing bacteria that can substitute for synthetic nitrogen fertiliser in any crop.

Dr Dent said the practical implications of this invention had the potential to transform global agriculture as we know it.

“Today I will tell the story of how, together with my colleagues, we took a nitrogen-fixing concept from the laboratory all the way to a field product that can be sold,” he said.

“It might seem like it was a straightforward process, but it was far from that.”

Dr Dent said the nitrogen-fixing capabilities of intracellular Rhizobia bacteria (within the root nodules of legumes) and their benefits have been well known and utilised in agriculture for more than a century.

“Scientists have generally believed that root nodules are essential for biological nitrogen fixation (BNF) and have therefore considerable amounts of time, effort and money has been spent in the attempt to engineer root nodules into cereals – unsuccessfully,” he said.

Dr Dent said the scientific BNF community previously considered it impossible that other nitrogen-fixing bacteria could form the necessary intracellular symbiotic relationship in non-leguminous crops without the need for root nodules, let alone provide yield benefits sufficient to substitute for synthetic nitrogen fertilisers.

“How wrong they were,” he said.



Dr David Dent and Hackett Professor Kadambot Siddique in the Alan Robson Agriculture Lecture Theatre.

“We have proven it’s possible to substitute a significant amount of nitrogen (that is usually provided by fertilisers) with this nitrogen-fixing bacteria, all the while maintaining and perhaps even increasing yields.”

[Watch the lecture recording on the Institute’s YouTube channel.](#)

Strengthened ties with China Agricultural University

Touted as among the top three agricultural events in the world, The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique was honoured to present at the 2024 World Agrifood Innovation Conference in China.

Professor Siddique delivered a keynote speech at the opening ceremony on 11 October, speaking to the theme of ‘In response to climate change and agrifood systems transformation: What adjustments universities and institutions should be making in research and teaching?’.

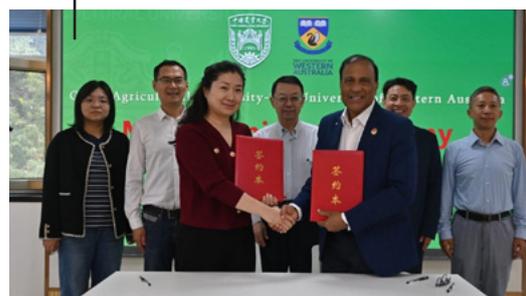
The two-day conference and expo event was hosted and co-organised by China Agricultural University (CAU).

During his time in Beijing, Professor Siddique represented UWA in the renewal of its Memorandum of Understanding with CAU.

Having established the joint agreement in 2008, the two universities have effectively collaborated on PhD training, joint workshops and conferences, staff exchange and various research projects.

“It has been a productive partnership and there will no doubt be many more enhanced activities in our future,” Professor Siddique said.

Hackett Professor Kadambot Siddique and CAU leaders following signing the renewed Memorandum of Understanding.



During his visit, he delivered three invited lectures at CAU which was attended by more than 10,000 people in-person and online.

He was also humbled and honoured to receive a CAU Adjunct Professorship.

During the presentation, CAU College of Resources and Environmental Sciences Professor Lixing Yuan congratulated Professor Siddique on his appointment and praised him as an old friend with a profound academic influence.

“The strong cooperation between our universities has not only been close, but also long-lasting, bringing many benefits to both parties,” Professor Yuan said.

Professor Vercoe follows in his father's footsteps with AAAS Fellowship

When asked which of the esteemed scientists he is most proud to join as a Fellow for the Australian Association of Animal Sciences (AAAS), the answer comes easily for Professor Phil Vercoe.

"Perhaps not surprisingly, when it comes to other Fellows who have inspired me, my father tops that list," Professor Vercoe said.

The UWA Institute of Agriculture Associate Director and Deputy Head of the UWA School of Agriculture and Environment said being named an AAAS Fellow was one of the more emotional moments in his career.

"It was completely unexpected and really was a very humbling experience," he said.

"I think the emotion and honour stems from my peers considering my contribution worthy of joining a list of people I have looked up to and respected for my entire career.

"And of course, the fact that I joined my father, which I believe makes us the only father-son combo on the list."

Dr John Vercoe was a key player in international livestock research, who made many important contributions to Australia's cattle industry through his time at the Commonwealth Scientific and Industrial Research Organisation and various divisions in Queensland.

Professor Vercoe reminisced that it was helping his father, alongside his brother and sister, on weekends down at the Animal Genetics Division in Rockhampton that likely led him down the path of pursuing livestock production.

"It was the stories he used to tell after coming back from international trips that made me realise just how critical agricultural research was to providing stability in communities."

Professor Vercoe emphasised that there was many AAAS Fellows who had supported and mentored him over the decades, including emeritus professors Ron Leng, John Nolan, Dave Lindsey, Graeme Martin and Professor Reg Moir.

As he reflects on his past three decades at UWA, there are several professional highlights that stand out in his mind.



Professor Phil Vercoe

The most significant achievement was winning the Australian Museum Eureka Award for Sustainable Agriculture in 2013 alongside his 'Enrich Project' colleagues within the Future Farm Industries CRC.

The remaining highlights were his sabbaticals at the Rowett Research Institute in Scotland, and with the joint International Atomic Energy Agency and FAO's Animal Production and Health Division in Vienna.

"However, one of the consistent highlights over my career has been the annual graduation ceremonies and watching the many clever students who complete their degrees who are keen to get into the workforce and make a difference in our industry," he said.

As for the future, Professor Vercoe said he was looking forward to working as part of the 10-year national Zero Net Emissions in Agriculture Cooperative Research Centre team, leading Program 2 'Towards methane-free sheep and cattle'.

"The CRC is very exciting at a time when there needs to be greater clarity around ways to reduce greenhouse gas emissions in Australian agriculture," Professor Vercoe said.

"Above all, we need to inspire the next generation of clever, younger people into agriculture, and I hope to continue to contribute to that."

Professor Phil Vercoe
philip.vercoe@uwa.edu.au



Professor Phil Vercoe with his father on his first day of university in 1983.

Grounded in greatness: Celebrating five decades of Emerita Professor Abbott at UWA



The crowd delivers a standing ovation to Emerita Professor Lynette Abbott.

As the standing ovation continued into its second minute, there was the distinct feeling that not one person in the audience wanted this expression of love and appreciation of Emerita Professor Lynette Abbott to come to an end.

Centre-stage and smiling was Professor Abbott – having just delivered the final presentation tracing her research journey ‘From the Galapagos to soil science at UWA’.

The UWA School of Agriculture and Environment and The UWA Institute of Agriculture hosted a special in-person symposium ‘Grounded in Soil Science’ to mark her Golden Jubilee of service and research on 18 November.

The opening address was delivered by UWA Senior Deputy Vice-Chancellor Professor Tim Colmer, during which he announced that the UWA Senate would award Professor Abbott its Chancellor Medal at an upcoming December graduation ceremony.

Head of SAgE Associate Professor Matthias Leopold then took the audience through a history of her impressive research career.

Professor Abbott’s pioneering research has advanced the understanding of plant-soil interactions in agriculture and disturbed ecosystems.

Demonstrating her deep connection to the agricultural community across WA, she takes tremendous joy in translating scientific theory into practice.

As a globally recognised leader in soil science and soil biology, Professor Abbott is a passionate science communicator and dedicated advocate for women in science.

She conducts regular workshops with farmers and advisors across Australia, actively supports global food security through research and training, and coordinates the WA State Committee of the Crawford Fund.



Attendees shared memories and messages throughout the afternoon.



Grounded in Soil Science symposium presenters pictured with Professor Abbott (centre) outside the lecture theatre.

Emerita Professor Abbott delivering her presentation.



Research Associate Hira Shaukat with her mentor Professor Abbott at the afternoon tea.



Associate Professor Leopold then introduced testimonials from the Ag Institute of Australia Chair Dr Don Burnside, President of Soil Science Australia WA George Mercer, and President of Graduate Women WA Felicity Farrelly.

The first of the symposium talks was delivered by DPIRD Soil Science & Crop Nutrition Manager Chris Gazey on 'A journey in soil management for broadacre agriculture in WA'.

UWA School of Agriculture and Environment Associate Professor Louise Barton then led the crowd through her 10-year perspectives on nitrous oxide emission from cropping soil in WA.

Filled with personal anecdotes from several decades of friendship, the Institute Director Hackett Professor Kadambot Siddique presented a talk on Professor Abbott's impact at UWA Farm Ridgefield.

Midway through the event, the crowd then spilled out of the Wilsmore Lecture Theatre to the Prescott Court Gardens, where members of Students of Natural

and Agricultural Sciences (SNAGS) had set up a garden party complete with decorations of dried barley and native flowers in vases.

Before cutting no less than three celebration cakes, Professor Abbott's brother delivered a moving toast which culminated in a rousing three cheers and applause.

Fourth-generation farmer, co-founder of Liebe Group, and non-executive director of Perth NRM Stuart McAlpine delivered his talk 'Sowing Curiosity: A Half Century of Soil Science Inspiring from Academia to New Horizons in Soil Health' upon returning to the lecture theatre.

CSIRO Adelaide Principal Research Scientist Dr Mark Farrell presented on mechanisms of soil carbon storage, followed by the person of the hour: Professor Abbott.

[Watch the symposium recording](#) on the Institute's YouTube channel.

Boosting ag-tech impact through collaboration

Greater collaboration will lead to greater innovation, project scope and overall impact for forthcoming research involving digital technologies in agriculture, according to Murdoch University Professor Ferdous Sohel.



As the inaugural program lead of Agricultural Technologies of WA Agricultural Research Collaboration (WAARC), Professor Sohel encouraged WA universities, research institutions and grower groups to work together towards their mutual goals.

He provided insight into his latest research projects and spoke to the purpose and potential of WAARC at a guest lecture hosted by The UWA Institute of Agriculture in November.

Professor Sohel said digital transformation and artificial intelligence (AI) were among the key drivers for growth and innovation in almost every sector, including agriculture.

"We are investigating a range of projects to build digital capabilities and enhance digital technologies for improved farm productivity," he said.

"The projects include weed detection and classification, frost and drought stress analyses, pest and disease detection and control, ruminant behaviour analysis, and low resource data communication in highly remote settings."

Professor Sohel also presented research findings on AI-based plant frost detection from infrared thermal imagery and advanced AI-based plant disease detection from RGB imagery.

"Emerging technologies and automation should be through together and applied into agriculture to bring benefit to the farmers."

Hackett Professor Kadambot Siddique, Professor Ferdous Sohel, WAARC Director Dr Kelly Pearce and Shadow Minister for Agriculture and Food the Hon. Colin de Grussa.

In closing, Professor Sohel emphasised the enormous potential of WAARC.

"Too often, there are so many people working on so many things and these efforts are duplicated," he said.

"Instead, if these efforts are put together through a collaborative project led by WAARC, they can attract more funding, more partners and will reinforce a bigger impact."

[Watch the lecture recording on the Institute's YouTube channel.](#)

Reproduction roadblocks and resolutions for the future of grazing livestock in Australasia

What major challenges do the next two decades have in store for the management of reproduction in grazing sheep and cattle in Australia and New Zealand?

UWA Emeritus Professor Graeme Martin and research collaborators recently shared their perspectives in the 50th anniversary special edition of the journal *Theriogenology*.

The authors explored reproduction challenges in the sheepmeat, dairy and beef industries of Australia and New Zealand – recognising the important context of large herds being managed over large areas, as well as the impact of global heating.

They considered the many reproduction challenges in detail, from increasing the productive lifespan of ewes, to the length of post-partum anoestrus, failure to conceive, and failure to maintain pregnancy in northern rangeland cattle.

They also took into account external challenges such as the need to reduce environmental footprint, pressure on the hormonal management of reproduction, and the impact of global heating on animal wellbeing and productivity.

Professor Martin said there were many opportunities for improving reproductive performance, such as management technologies like animal sensors and virtual fencing, and genomic technologies like sperm sexing, the generation and transfer of embryos, and precision gene-editing of gametes and embryos.

"As we gain deeper understanding of the processes involved, we should be able to make progress," he said.

"Improvements in reproductive performance will increase productivity and should also be associated with significant improvements in animal well-being and methane emissions intensity.

"To capture these benefits, we need lateral thinking about reproductive technology for extensive grazing systems, and a transdisciplinary approach that brings together the systems biology of grazing animals with an understanding of the barriers to adoption by farmers."

Emeritus Professor Graeme Martin
graeme.martin@uwa.edu.au

Vale Emeritus Professor Alan Robson

The UWA Institute of Agriculture honours the life and legacy of Professor Alan Robson: a generous leader, brilliant agricultural scientist, and former Vice-Chancellor of UWA.

Alan's passing in late October marked a profound loss, not only for those who knew him personally but also for the countless students, colleagues, and communities he touched across UWA, Australia and beyond.

He was a steadfast and true supporter of the Institute and served our University with unwavering dedication – embodying humility, generosity, and a lifelong commitment to education.

He was champion of internalisation of UWA and an advocate of international students.

In reflecting on Alan's many contributions, we mourn not only a distinguished leader, but a true friend and mentor to many.

In the time since we bid him final farewell at Winthrop Hall, those who were lucky enough to have known him have shared hundreds of cherished memories of Alan, myself included.

We have fondly heard how he raced to check on his beloved glasshouses the morning after the infamous Perth hailstorm in 2010, and how he would take the Ag Science student list home and memorise each name and photo.

Here, we pay tribute to his character and spirit by sharing a small handful of these stories from contributors to agriculture and related sciences at UWA.

Sincerely,

Professor Kadambot Siddique
IOA Director and Hackett Professor
of Agriculture



"I began a long research and teaching collaboration with Alan in 1974, for which I was very fortunate. Alan created a very creative environment for the development of undergraduate and postgraduate students, and industry-based researchers through his extensive knowledge of agriculture beyond his core disciplines of plant nutrition and soil science. He had an extra-ordinary capacity to contribute across disciplines and to challenge entrenched ideas."

Emerita Professor Lynette Abbott
IOA and the UWA School of Agriculture
and Environment

"The International Centre for Plant Breeding Education and Research was supported by Professor Alan Robson as VC in 2008 – and helped to promote UWA's position as a leading research and education institution in plant breeding. We now attract many MSc and PhD international students in plant breeding and related areas because of Professor Robson's support."

Professor Wallace Cowling
IOA Associate Director

"Alan was an enormous support for my husband and I when we moved from Australia to the United States. I was all sorted out with a nice PhD fellowship, but my husband – who'd just graduated from his UWA Ag PhD – was upping-stumps to a place where he had no network or connections. Alan changed that, making personal connections and writing letters of introduction for him, who rapidly found rewarding work. What a generous soul he had. Vale Alan."

Associate Professor Sally Thompson
IOA research theme leader and co-Director of CWSS

Professor Robson visiting a canola field in his younger days.



Emeritus Professor Alan Robson as many knew him, during his six years as Vice-Chancellor of UWA.

"Alan encouraged us as students to listen and learn from farmers, our teachers, and members of the agriculture industry. To think, ask questions, and integrate our knowledge. Alan gave us confidence that there was not only room to contribute, but that all contributions were needed to make a different collectively."

Professor Tim Colmer
UWA Senior Deputy Vice-Chancellor

"I started my PhD under the supervision of Professor Alan Posner, who sadly passed away within six months after I started my PhD. Being new to this alien place, I was struggling to find the bearings in my research directions; it was Prof Alan Robson who was kind enough to accommodate me under his wings."

Professor Nanthi Bolan
IOA and the UWA School of Agriculture
and Environment

"One of the things I found remarkable about Alan was his personal warmth, and that incredible capacity to be able to greet almost every member of staff at UWA by name. He took time for people – the quick email to say he saw a recent paper and found it really interesting, asking a pertinent question or two, personal congratulations for an achievement or other – all just some of the ways that Alan fostered a sense of community and pride in UWA where people felt supported."

Professor Pauline Grierson
Deputy Head of the School of
Biological Sciences

PhD candidate Amber Balfour-Cunningham shows a visitor how to view the minute Trichogramma wasp – a parasitoid of the DBM – through a microscope.



Buzzing interest at IOA's Dowerin info stall

Passerbys were caught doing double-takes when they spotted live diamondback moths (DBM) fluttering around a netted capsule at The UWA Institute of Agriculture's info stall at the Dowerin Machinery Field Days this year.

You could forgive most farmers and agricultural scientists for their apprehension, as these detested pest moths can wreak millions of dollars of havoc on canola crops.

Thankfully, PhD candidate Amber Balfour-Cunningham was quick to explain that the critters were to demonstrate her research to improve monitoring and knowledge of the natural enemies of DBM, and in turn increase confidence in pest management decisions.

The Institute's info stall within the DPIRD shed was a hive of activity over the two days of the event.

PhD candidate Samantha Harvie was kept busy discussing her Grains Research and Development Corporation-funded project on nitrogen management strategies to improve wheat grain yield and quality.

Concurrently, UWA School of Agriculture and Environment senior lecturer Dr Caitlin Moore shared results from the ecosystem monitoring station at UWA Farm Ridgefield and counselled prospective UWA students.

A group of SNAGS Dowerin Camp students visited on the first day, followed by researchers Yadav Padhyoti and German Puga who promoted currently projects led by the UWA Centre for Agricultural Economics and Development.



Communications Officer Rosanna Candler, PhD candidate Samantha Harvie, and senior lecturer Dr Caitlin Moore at the Institute's info stall.

Shining a light on effects of elevated CO₂ and AMF

Almost all elevated atmospheric CO₂ (eCO₂) studies have focused on plant performance under monocultures, however Professor Xinhua He has a different research approach.

During a recent guest lecture hosted by The UWA Institute of Agriculture, Sichuan Agricultural University Endowed Professor He explored 'Interactive responses of wheat-faba bean intercropping to elevated CO₂ and arbuscular mycorrhizal fungus (AMF)'.

By employing 15N (nitrogen) and 13C (carbon) stable isotopes, high-throughput sequencing and other processes, Professor He has been studying C/N cycling in plant-soil-microbe systems, and interplant C/N movement under global environmental change scenarios.

"There are limited considerations of interactions with AMF under

intercropping, let alone under the same, yet unrealistic, daytime and nighttime CO₂ concentrations," he said.

"Mycorrhization and/or eCO₂ have varied interactive effects on plant biomass production and physiological characteristics, no matter whether plants were grown in monocultures or intercropping.

"Such interactive effects are probably plant host-species or cropping pattern dependent."

[Watch the lecture recording](#) on the Institute's YouTube channel.



Professor Xinhua He presenting his talk in the Alan Robson Agriculture Lecture Theatre.

Making a splash: Aquaculture Facility manager charts course for research success



From teaching an eager group of postgrads, to water sampling and weighing fish – there is no such thing as an ‘regular day’ for Dr Katarina Doughty.

This year, School of Molecular Sciences Associate Lecturer Dr Doughty took over the academic management of the Aquaculture Facility at the UWA Shenton Park Field Station.

Her varied role includes developing, initiating, and overseeing research projects at the Facility as well as integrating its use into UWA’s new Aquatech and Blue Economy units.

“Depending on the time of year, my days can range from teaching, running master’s and industry projects, water sampling, microscopy work, weighing fish, engineering tank systems or exciting meetings about innovative research and partnerships,” she said.

“This position has opened my eyes to the growing importance of modern aquaculture and potential of new Aquatic (Blue) Technologies.

“It has allowed me to step outside food production and see its potential in transforming the exploitative aquarium trade, combating climate change, producing sustainable materials such as bio-fuel, bio-plastics, and much more.”

Dr Doughty said she was looking forward to advancing UWA’s Blue Economy and AquaTech research impact through new industry partnerships and research collaborations in Australia and internationally.

“If done correctly, aquaculture supports a sustainable earth as it improves food security and nutrition by increasing food production, reducing dependence on land and water resources, boosting economic growth in coastal and rural areas, and conserving our aquatic ecosystems.”

“Without question, aquaculture will be vital if we want to address the significant imbalance that exists between the little remaining unused land and water on our planet and our need to grow more food for our growing population,” she said.

Dr Katarina Doughty tossing fish feed into tanks at the Aquaculture Facility.

“If we meet our commitment to sustainably manage 100 per cent of our aquatic resources by 2025, we will produce six times more food, generate 40 times more renewable energy and lift millions out of poverty, using less land, oil and water.

“Our research plans to align with global efforts into sustainable development and growth of Aquatech, which serves as a framework for international cooperation to help people and the planet thrive.”

The Facility is currently running a novel Living Ecosystem project determining the feasibility of growing ‘live sand’ in the context of developing a ‘living coral reef ecosystem’.

In 2025, researchers plan to initiate additional marine fish projects and re-introduce trout and salmonid studies aimed to drive sustainable and novel technologies in the field.

Dr Katarina Doughty
katarinahelena.doughty@uwa.edu.au



2024 Dowerin Camp attendees in front of a canola field at Flame Tinge Farm.

UWA Ag students snag an unforgettable camp experience

The opportunity to form valuable friendships with fellow students – many of whom will one day be his colleagues in the agricultural industry – was just one of the many perks of the recent SNAGS Dowerin Camp for River McGregor.

The UWA Institute of Agriculture sponsored transport costs for the annual camp, which aims to add value and practical understanding to undergraduate students' university experience with on-farm visits, industry walk-throughs and field day trips.

"The connections made during the camp have already made my university studies much more enjoyable and meaningful," Mr McGregor said.

"This camp brought together individuals from both agricultural and non-agricultural backgrounds, fostered passion and inspired students to pursue careers in agriculture."

On the first day of the 2024 SNAGS Dowerin Camp, participants toured the Gilmac Hay facility in New Norcia, where they observed advanced hay pressing, handling, and pelleting equipment and gained insights into the fodder export industry.

Their next stop was Flame Tinge Farm in Konnongorring to watch a sheep shearing demonstration, discuss innovative farming practices, and tour crops, farm equipment, and sheep handling facilities – followed by lunch generously provided by the family.

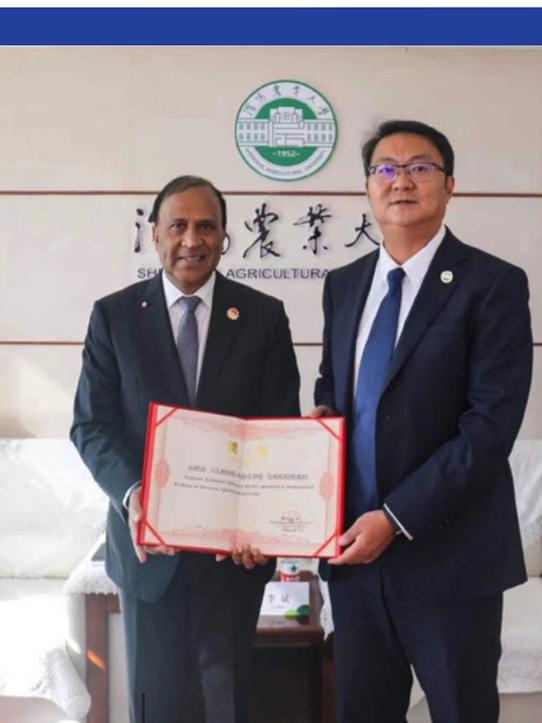
After arriving at Cadoux, the campers met with rural input and advisory service Delta Agribusiness, where they

engaged in meaningful discussions and built connections.

The second day was spent entirely at the Dowerin Field Days – with their first port-of-call being a visit to the Institute's info stall.

The students explored the latest agricultural innovations, technologies, and practices at WA's largest agricultural expo.

On the last day, students visited a wheat trial site managed by Nutrient Ag Solutions to learn about soil-plant interactions, plant physiology and the impact of fertiliser rates on wheat yield and protein content.



Hackett Professor Kadambot Siddique and SAU President Professor Li Bin.

Director helps strengthen Chinese university connections

The UWA Institute of Agriculture Hackett Professor Kadambot Siddique and Dr Jiayin Pang recently represented UWA in unveiling the China-Australia Joint Laboratory for Plant Nutrition and Germplasm Resources Innovation at Shenyang Agricultural University (SAU), China.

The joint laboratory building will be completed in mid-2025 and will focus on basic and translational research and postgraduate training.

During this visit, Professor Siddique also received the renewal of his Distinguished Professorship from SAU President Professor Li Bin.

In early November, Professor Siddique delivered a keynote presentation and chaired a forum session at the 3rd International Forum on Soil, Fertilizer, Crop and Environment at Northwest A&F University (NWFU), China.

"Alongside my colleague Professor Zed Rengel, it was great to catch up with collaborators and postgraduate students from key agricultural universities in China," he said.

Professor Siddique also signed a renewal of the Memorandum of Understanding between UWA and NWFU.

Since first signing the MoU in 2005, the two universities have collaborated on student exchange, joint undergraduate programs, PhD supervision, events, and high-quality research primarily focused on dryland agriculture and sustainable food production systems.

Professor Siddique was also humbled with a renewal of his Visiting Professorship within the College of Soil and Water Conservation Science and Engineering (Institute of Soil and Water Conservation) at NWFU.



A faba bean plant infected with faba bean gall disease.

Dr Martin Barbetti discusses the resistance levels of various faba bean varieties with faba bean breeder Mesfin Tadele. Photo: ACIAR Communications Officer May Muthuri

UWA scientists help secure future of faba bean farming in Ethiopia

When faba bean gall disease arrived in Ethiopia about a decade ago, the disease quickly took over smallholder farmer Desta Woldearegay's fields – destroying the precious harvest that her family relied on for food and income.

Those dark days will soon be firmly in the past, thanks to new varieties and better management practices introduced by UWA scientists through an Australian Centre for International Agricultural Research (ACIAR) funded project.

"I am now hopeful of a future where I can resume cultivating and boosting my yields," Mrs Woldearegay said.

Ethiopia's most crucial pulse crop is being safeguarded from FBG disease through UWA researchers' efforts to investigate the disease, identify its cause for the first time, and introduce new management strategies to curb its spread. The \$1.97 million initiative is a collaboration between UWA and the Ethiopian Institute of Agricultural Research, Amhara Agricultural Research Institute, International Center for Agricultural Research in the Dry Areas, and NSW Department of Primary Industries.

The latest findings were reported during a recent project review and highlighted the conditions driving the spread of FBG in Ethiopia's Amhara, Oromia and Tigray regions.

The report showed increased incidence of FBG is associated with high altitudes,

poor soil drainage, high weed density and suboptimal planting times.

Project lead UWA Professor Martin Barbetti said developing faba bean varieties resistant to the disease was a top priority for the project.

Together with UWA Research Fellow Dr Mingpei You, Professor Barbetti identified the actual causal pathogen (*Physoderma viciae*) and developed a rapid PCR test for its identification.

"Combined with great work by Ethiopian colleagues defining its epidemiology and finding successful chemical control measures, this project has been foundational for development and implementation of successful management strategies against FBG disease," he said.

"Our ongoing research focuses on incorporating these traits into adapted faba bean lines to offer farmers long-term, sustainable solutions."

ACIAR Acting Program Manager (Crops) Dr Richard Brettell said the project had laid a timely foundation for the country's long-term sustainability of faba bean farming.

"Collaboration between Ethiopian and Australian scientists will continue to play a critical role in overcoming existing challenges and scaling the identified solutions to enhance food security in Ethiopia," Dr Brettell said.

The project has also developed research capacity through supporting PhD students and training 26 Ethiopian scientists in disease management and crop improvement.

As the project transitions to its final phase, the research team plans to scale up the adoption of disease-resistant faba bean varieties and expand sustainable management practices across Ethiopia.

Professor Martin Barbetti
martin.barbetti@uwa.edu.au



Associate Professor Matthias Leopold, Dr Ben Biddulph, Professor Tim Colmer, the Hon. Jackie Jarvis, Professor Kadambot Siddique and Cec McConnell.

Shenton Park Field Station on show for 2024 Open Day

On a picture-perfect spring day in September, more than 250 science enthusiasts gathered at the UWA Shenton Park Field Station to engage with a wide range of innovative research.

The UWA Institute of Agriculture, UWA School of Agriculture & Environment, School of Engineering, School of Biological Sciences and School of Molecular Sciences jointly hosted the 2024 Open Day, which featured six project site demonstrations and four info stalls.

At the welcome presentations, the UWA Senior Deputy Vice-Chancellor Professor Tim Colmer introduced the WA Minister for Agriculture and Food the Hon Jackie Jarvis MLC.

In addition to officially opening the event, Mrs Jarvis had the special honour of officially launching the first two annual pasture legumes developed by researchers from UWA and DLF Seeds joint venture Annual Legume Breeding Australia.

The Institute Director Hackett Professor Kadambot Siddique said the event was a tremendous opportunity to showcase and celebrate the richness of multidisciplinary research at UWA.

“For more than six decades, the Shenton Park Field Station has been servicing the science and agriculture industry of Western Australia. It has – and always will be – a deeply collaborative site.”

“Dozens of notable undergraduates, Master’s and doctorates have made great use of this facility for their groundbreaking research over the decades,” Professor Siddique said.

“Major breakthroughs in the release of new varieties of cereals, canola, pulses, subclovers and pastures have been bred and released from this facility – and the Field Station has housed or contributed to numerous notable CRCs over the years.”

With the aim to dramatically improve the yield potential of wheat, InterGrain explained how it has combined its well-



Dr Sheng Chen presents his research among canola plants in the shadehouse.

Demonstrating the wave flume in action at the Coastal & Offshore Research Lab.



CEI:AgER ecological restoration tech lead Dr Monte Masarei and agricultural tech lead Dr Wesley Moss co-presenting.



adapted Australian genetics with Inari's predictive design and multiplex gene editing capabilities.

Visitors to the Coastal & Offshore Research Lab engaged with a range of ocean research applications from coastal protection to marine renewable energy generation and aquaculture.

Meanwhile, at the Aquaculture Facility, attendees learnt about how aquaculture is a rapidly growing industry that offers a potential alternative to meet global protein requirements.

Dr Sheng Chen introduced eager crowds to the research progress of his GRDC-funded project to improve canola tolerance to heat stress.

“The Open Day provided a fantastic opportunity for us to demonstrate our canola heat tolerance screening in action. It also established a wonderful platform for our researchers to have a face-to-face communication with crop growers.”

Dr Sheng Chen

At the UWA Centre for Engineering Innovation: Agriculture & Ecological Restoration (CEI:AgER), Director Associate Professor Andrew Guzzomi showed how the Centre provided engineering solutions and methodologies for agricultural prosperity and ecological restoration.

Set up with a microscope, the Animal Care Services team showed how they support biological and biomedical UWA research projects in a range of contained housing environments and research facilities.

The ARC Centre of Excellence in Plants for Space ran a popular and interactive info stall on the UWA node of Plants for Space.

Visitors learnt more about UWA's involvement in the Zero Net Emissions Agriculture CRC from members of the UWA Centre for Agricultural Economics and Development.

The Centre for Water and Spatial Sciences stall demonstrated how the Centre was providing evidence-based solutions to complex water and spatial challenges at UWA.



A group of people gather in the field plots to hear from ALBA researchers Associate Professor Phillip Nichols and Brad Wintle.

Bradley Wintle and Associate Professor Phillip Nichols with their subclover Edison at the UWA info stall.



Edison sparks interest at Australian Agronomy conference

While not quite as famous as its namesake, the newly-launched annual pasture legume Edison still attracted a fair amount of attention at UWA's info stall during the 21st Australian Agronomy Conference in Albany.

Edison is one of two new annual pasture legumes developed by researchers as part of the UWA and DLF Seeds Australia joint venture Annual Legume Breeding Australia (ALBA).

ALBA lead researcher Associate Professor Phillip Nichols, Senior Research Officer Bradley Wintle and UWA PhD candidate Huyen Pham set up and ran the popular info stall during the conference in October.

The stall featured flyers, research brochures, newsletters and giveaways from joint-sponsors The UWA Institute of Agriculture, UWA School of Agriculture and Environment, and UWA Albany Campus.

UWA was front and centre at the opening of the conference, with keynote speakers UWA Professor of Biodiversity Steve Hopper presenting alongside Meringar Barduk Elder Lynette Knapp on 'Cross-

cultural perspectives on plant diversity of the Southwest Australian Floristic Region, a Global Biodiversity Hotspot'.

Associate Professor Nichols presented a talk on 'A new ecologically-based breeding method has resulted in three new subterranean clover cultivars with greater biomass and resilience'.

Lecture calls for UWA and UMP to join research forces

What can Australia learn from South Africa in terms of their response to the impact of climate change on food security, and vice versa?

The UWA Institute of Agriculture recently hosted University of Mpumalanga (UMP) Professor Ndiko Ludidi for a guest lecture on 'Relevance of plant science research to resilience of food systems: Opportunities for UMP partnerships with UWA'.

Professor Ludidi, who is the Dean of UMP's Faculty of Agriculture and Natural Sciences, said several similarities in climate existed between South Africa and Australia.

"Common to both is that climate change poses a threat to food security, and this requires adaptation of the food systems in the two countries to build resilience

of the countries' food systems to climate change," he said.

The lecture focused on how South Africa's food systems were being impacted by climate change.

Professor Ludidi illustrated how plant diversity and crop genetic diversity, together with rhizospheric microorganisms, can be a resource for improving crop adaptation to some of the effects of climate change, with a focus on drought, heat and salinity.

In closing, he said there was a great deal of complementary science and commonality between agricultural and environmental research at his faculty and UWA.

"Today I provided a snippet of the work that we do, so that I could indicate what future research collaboration possibilities may look like," he said.



Professor Ludidi presenting his lecture at the Alan Robson Agriculture Lecture Theatre.

"There are synergies between our two universities that we should explore."

[Watch the lecture recording](#) on the Institute's YouTube channel.



UWA Master's student Allan Williams runs a demonstration of the Avon CZO at UWA Farm Ridgefield.

Best flux forward: UWA hosts OzFlux workshop and conference

Heavy rain and muddy fields thankfully did not dampen spirits during a daytrip to UWA Farm Ridgefield to see its flux tower and Avon Critical Zone Observatory (CZO) facility in action.

The visit was held on the third day of the annual OzFlux Conference in late November, hosted by the Centre for Water and Spatial Science (CWSS) at UWA's Crawley campus, with support from the Terrestrial Ecosystem Research Network (TERN).

The UWA Institute of Agriculture sponsored the day with packed lunches – which were much appreciated after a busy morning learning about the TERN Boyagin Wandoo Woodland flux tower, its paired agricultural site at Ridgefield, and the Avon CZO.

OzFlux is Australia and New Zealand's community of micrometeorological flux researchers and is one of several regional networks that belong to the global [FLUXNET](#) network.

These networks are responsible for operating flux towers, with instrumentation that continuously measures exchange of carbon dioxide, water vapour, and energy between terrestrial ecosystems and the atmosphere.

The OzFlux Conference included two days of talks across four themes: agroecosystem measurement and modelling, ecological applications of flux science, advances in flux science and integration of novel measurement techniques, and scaling flux science with remote sensing and modelling.

Participants joined both in-person and online from research institutions, local

government, and industry, as well as international participants from Japan, China, Indonesia and Europe.

On the first day, the Institute Director Hackett Professor Kadambot Siddique presented an overview of UWA Farm Ridgefield and the Best Practice Farming Systems Project.

In the evening of day two, early career researchers asked career advice from a diverse panel including TERN director Dr Beryl Morris, OzFlux director Professor Stefan Arndt, deputy OzFlux chair Dr Sam Grover and UWA senior lecturer and OzFlux communications officer Dr Caitlin Moore.

A week earlier, UWA also hosted the five-day OzFlux and TERN-supported flux data workshop.

It included lectures on the theory and practice of eddy covariance and demonstrations of instrumentation from industry partners LICOR Biosciences and Campbell Scientific.

Participants also received hands-on training in the processing of raw eddy covariance data to a gap filled and partitioned dataset using the PyFluxPro tool.

A hybrid session provided an overview of the requirements to submit flux tower data to the upcoming [FLUXNET2025](#) global data collation effort.

Dr Caitlin Moore
caitlin.moore@uwa.edu.au

Participants on day two of the OzFlux Conference at UWA. Photo: Liena Fordham



Brassica researcher blooms during GRDC visiting fellowship

A deeply rewarding two-month GRDC visiting research fellowship spent at The UWA Institute of Agriculture culminated in Huazhong Agricultural University (HZAU) Professor Jun Zou delivering a special lecture on her latest research.

Professor Zou presented on ‘Genome-wide reconstruction of a de novo domesticated diverse synthetic *Brassica napus* population’ at the Alan Robson Agriculture Lecture Theatre.

Through her research, she has developed three hybrid canola cultivars, and mainly focuses on creating and exploring *Brassica* novel genetic diversity by interspecific introgression with genomics-based approaches.

“*Brassica napus* is the worldwide important oilseed crop, and also a young allotetraploid species with limited genetic diversity and short history of cultivation,” she said.

“Synthesis of allopolyploid has played an important role in creating crop genetic diversity and genome evolutionary study.”

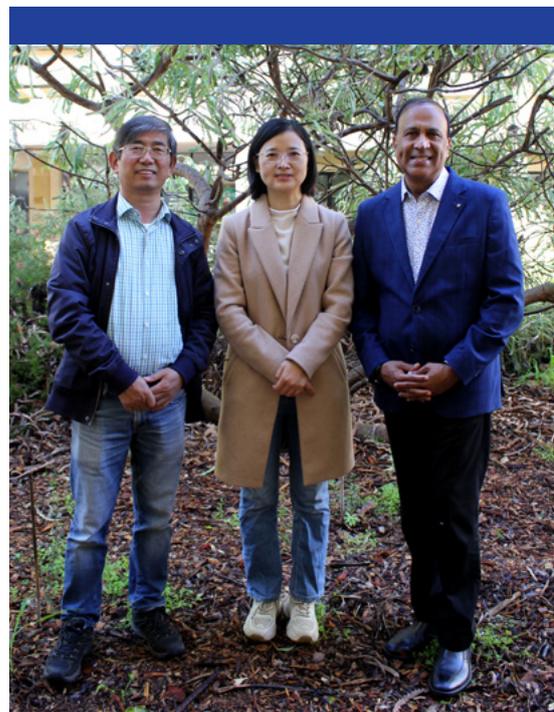
To expand the genetic basis of *B. napus* and promote its utilisation of heterosis between different genetic groups, with synthesis by a large scale of interspecific

crossing, Professor Zou and her colleagues developed a novel gene pool.

They named this pool new-type *B. napus*, with pan-genomic based introgression from three related oilseed *Brassica* species.

With omics-analysis and genomic selection, the researchers further explored the approach for accelerating the utilisation of such novel genomic variation for canola breeding.

“These results would provide insights for introducing and exploring novel genomic diversity and heterotic group in crop breeding by synthesis of allopolyploids.”



Dr Sheng Chen, Professor Jun Zou and Hackett Professor Kadambot Siddique.

Professor Zou closed her lecture by emphasising the value of future collaboration between UWA and her departments of the National Key Laboratory of Crop Genetic Improvement and College of Plant Science & Technology at HZUA.

[Watch the lecture recording](#) on the Institute’s YouTube channel.

Awards, positions and industry recognition

Name	Award
Emerita Professor Lynette Abbott	2024 UWA Chancellors Award
H/Professor Kadambot Siddique	Visiting Professorship at Northwest Agriculture and Forestry University China
H/Professor Kadambot Siddique	Visiting Professorship at Universitas Brawijaya, Indonesia
H/Professor Kadambot Siddique	Adjunct Professorship at Jamia Hamdard, India
Professor Phil Vercoe	Fellow of the Australian Association of Animal Sciences
Professor Ken Flower	Fellow of the Australian Society of Agronomy
H/Professor Kadambot Siddique	Adjunct Professorship at China Agricultural University, China
H/Professor Kadambot Siddique	Distinguished Professorship at Shenyang Agricultural University, China
UWA Students of Natural and Agricultural Sciences (SNAGS)	First place in the Ag Institute Australia WA Industry All Stars competition
Agricultural Sciences at The University of Western Australia	Ninth in the world and number one in Australia – Shanghai Academic Ranking of World Universities 2024
H/Professor Kadambot Siddique	The Australian’s 2025 Research Magazine – Leading researcher in the field of Agronomy & Crop Science
Professor Sergey Shabala	The Australian’s 2025 Research Magazine – Leading researcher in the field of Botany

Name	Award
Professor Nanthi Bolan	<i>The Australian's</i> 2025 Research Magazine – Leading researcher in the field of Environmental Sciences
Professor Martin Barbetti	<i>The Australian's</i> 2025 Research Magazine – Leading researcher in the field of Plant Pathology
Soil Sciences at The University of Western Australia	<i>The Australian's</i> 2025 Research Magazine – Leading research institution in the field
Professor Sergey Shabala	Senior Research Award – 2024 Vice-Chancellor's Research Awards
Emerita Professor Lynette Abbott	UWA Chancellor's Medal
H/Professor Kadambot Siddique	Recognised as 2024 Top Cited Scholar by Scilit

Visitors to IOA

Name of visitor	Visitor's organisation and country	Host details	Dates of visit
Nagoya University Study Tour – eight students	Nagoya University, Japan	The UWA Institute of Agriculture	9-19 September
Professor Xinhua He	Sichuan Agricultural University, China	The UWA Institute of Agriculture	27 September
Dr GP Singh Dr Vijay Rana Dr Sundeep Kumar	Indian Council of Agricultural Research (ICAR) - National Bureau of Plant Genetic Resources, India	The UWA Institute of Agriculture	27 September
Dr Girish Jha Dr Jyoti Kumari Dr Neeraj Budhlakoti	ICAR-Indian Agricultural Statistics Research Institute, India	The UWA Institute of Agriculture	27 September
Dr PK Bhati Dr Manish Vishwakarma	Borlaug Institute for South Asia, Ludhiana	The UWA Institute of Agriculture	27 September
WA Governor His Excellency the Honourable Christopher Dawson AC APM Darrilyn Dawson	Government House, WA	The UWA Institute of Agriculture & Farm Manager Tim Watts	30 September
Jackie McBurney Andrew Dover	Shire of Pingelly, WA	The UWA Institute of Agriculture & Farm Manager Tim Watts	30 September
Dr David Dent	University of Surrey, UK	The UWA Institute of Agriculture & Institute of Advanced Studies	3 October
Mercy Nyambura Mburu	University of Nairobi, Kenya	Associate professor Amin Mugeru	8 August-26 October
Dr Hima Bindu Kudapa	International Crops Research Institute for the Semi-Arid Tropics, India	The UWA Institute of Agriculture	8 October
Dr Frank Grosse Dr Olaf Sass Dr Urs Fischer Christoph Betschart	Norddeutsche Pflanzenzucht Hans-Georg Lembke KG, Germany	The UWA Institute of Agriculture & Professor Wallace Cowling	21-23 October
Professor Nick Hanley	University of Glasgow, Scotland		4-8 November
Professor Ndiko Ludidi	University of Mpumalanga, South Africa	The UWA Institute of Agriculture	5 November
Chris Gazey	DPIRD, WA	UWA School of Agriculture and Environment & The UWA Institute of Agriculture	18 November
Stuart McAlpine	Buntine, WA	UWA School of Agriculture and Environment & The UWA Institute of Agriculture	18 November
Dr Mark Farrell	CSIRO Adelaide	UWA School of Agriculture and Environment & The UWA Institute of Agriculture	18 November
Professor Deqiang Zhang Professor Qiaoxia Shang Professor Demei Li Associate Professor Xiaoxi Jin	Beijing University of Agriculture, China	UWA School of Agriculture and Environment & The UWA Institute of Agriculture	20 November
Professor Ferdous Sohel	Murdoch University, WA	The UWA Institute of Agriculture	21 November

New postgraduate research students (PhD)

Student	Topic	School	Supervisor(s)	Funding body
Yusi Zhang	Assessing and enhancing pasture and rangeland resilience in Western Australia: Integrative approaches for productivity mapping and climate impact analysis	School of Civil, Environmental and Mining Engineering	Assoc/Professor Nik Callow Dr Qiaoyun Xie	RTP Stipend - International Student WAARC HDR Top-Up Scholarship UWA International Fee Scholarship
Angelia Tanu	Enhancing field establishment potential for the next generation of climate-resilient canola	School of Biological Sciences	Professor Erik Veneklaas Dr Matthew Nelson Professor Wallace Cowling Dr Virginia Mwape Dr Sarah Rich	WAARC HDR Top-Up Scholarship University Postgraduate Award
Chloe Rout	Evaluating the benefits and overcoming barriers to adoption of intercropping and companion cropping of canola or cereals with legumes	UWA School of Agriculture and Environment	Professor Ken Flower Dr Andrew Fletcher Dr Mike Ashworth	WAARC HDR Top-Up Scholarship RTP Stipend - Domestic Student
Montana Walsh Baddeley	Understanding the genetic factors influencing meat quality and performance of rangelands beef cattle throughout the WA supply chain	UWA School of Agriculture and Environment	Professor Phil Vercoe Assoc/Professor Dominique Blache Dr Matt Walcott Dr Fiona Dempster	WAARC HDR Top-Up Scholarship RTP Stipend - Domestic Student
Mithun Ghosh	Integrating Renewable Energy Technologies into Australian Farming Systems: Exploring economic viability and community concerns	UWA School of Agriculture and Environment	Professor Marit Kragt Dr Germán Puga	ARC TC for Behavioural Insights for Technology Adoption

Memorandum of Understanding

Name	Date
UWA and China Agricultural University	October 2024
UWA and Beijing University of Agriculture	November 2024
UWA and Northwest Agriculture & Forestry University	September 2024

Research grants

Title	Funding period	Funding body	Investigators
Understanding the evolution of blackleg disease resistance genes in canola	2025	UWA Research Collaboration Award	Dr William Thomas, Professor Jacqueline Batley, Dr Mathieu, Rousseau-Gueutin, Dr Angela Van de Wouw
Adapting Aquaculture: Innovative Responses for Sustainable Food Security	2025	UWA Research Collaboration Award	Professor Phil Vercoe, Dr Katarina Doughty, Professor Jurgen Geist
Dissecting 70 years of wheat breeding via proteome-wide association study	2025	UWA Research Collaboration Award	Dr Hui Cao, Dr Richard Mott, Dr James Cockram
Integrating NanoSIMS and MIFE technologies for creating climate resilient crops	2025	UWA Research Collaboration Award	Dr Ping Yun, Professor Patrick Bienert, Professor Sergey Shabala, Dr Carmen Höschen, Dr Steffen Schweizer
WA lightsheet microscopy facility for fast and gentle volumetric imaging	2025	ARC Linkage Infrastructure, Equipment and Facilities grant	Dr Liisa Hirvonen, Em/Professor Lynette Abbott, Professor Ryan Lister, Assoc/Professor Ryusuke Takechi, Assoc/Prof Jennifer Rodger, Professor Crispin Dass, Dr May Aung-Htut, Dr Maria Elena Juan Pardo, Dr Catherine Boisvert, Assoc/Professor Raelene Endersby
Wheatbelt land-use paradigms – Navigating new industries in the low carbon and natural capital era	2024-2028	Australian Government Department of Agriculture, Fisheries and Forestry National Heritage Trust Capacity Building Grant	Carla Swift, Dr Michael Young, Professor Marit Kragt, James Shaddick, Dr Kim Brooksbank, Keith Claymore

UWA IOA 2024 Publications

Peer Reviewed Journals

September to December 2024

Abbasi AA, Saha S, Begum IA, Rola-Rubzen MF, McKenzie AM, Alam MJ (2024). Does rural transformation affect rural income inequality? Insights from cross-district panel data analysis in Bangladesh. *Heliyon* **10(9)** doi: 10.1016/j.heliyon.2024.e30562

Adhikari SP, Timsina KP, Rola-Rubzen MF, Timsina J, Brown PR, Ghimire YN, and Magar DBT (2024). Determinants of conservation agriculture-based sustainable intensification technology adoption in smallholder farming systems: Empirical evidence from Nepal. *Journal of Agriculture and Environment for International Development* **118(1)** 31–50 doi: 10.36253/jaeid-14682

Awasthi R, Devi P, Jha UC, Sharma KD, Roorkiwal M, Kumar S, Pareek A, Siddique KHM, Prasad PVV, Parida SK, and Nayyar H (2024). Exploring the synergistic effects of drought and heat stress on chickpea seed development: Insights into nutritional quality and seed yield. *Stress Physiology & Biochemistry* **14** doi: 10.1016/j.stress.2024.100635

Bai R, Liu H, Liu Y, and Yong JWH (2024). Effects of foliar application of magnesium fertilizer on photosynthesis and growth in grapes. *Agronomy* **14(11)** 2659 doi: 10.3390/agronomy14112659

Bardhan K, Gayan A, Padukkage D, Datta A, Chen Y, Penna S (2024). Silicon-mediated drought tolerance: An enigmatic perspective in the root-soil interphase. *Journal of Agronomy and Crop Science* doi: 10.1111/jac.12721

Batt PJ (2024). Food security: planning for our collective future. Proceedings 2nd Intl Conference on Food Technology and Nutrition, Bali. *Bio Web of Conferences* **98** 05002 doi: 10.1051/bioconf/20249805002

Bezerra ACM, Kotula L, Ortiz-Silva B, Medici LO, Colmer TD, and Reinert F (2024). NaCl-induced effects on photosynthesis, ion relations, and growth of *Chloris gayana* Kunth in the presence of two levels of KCl. *Plant Physiology and Biochemistry* **216** doi: 10.1016/j.plaphy.2024.109136

Bolan N, Srinivasarao C, Rocco C, Bolan S, Wani SA, Ahmad P, Weiss D, Northover G, Sánchez-Palacios JT, Cheng M, Bell R, Kumar GR, Naidu GM, Hou D, Jia X, Xie Y, Wang H, Antoniadis V, Melo TM, Shaheen SM, Rinklebe J, Kirkham MB, and Siddique KHM (2024). Zinc in soil-crop-animal-human health continuum. *Advances in Agronomy* doi: 10.1016/bs.agron.2024.09.004

Busi R, Flower K, Goggin D, and Onofri A (2024). Patterns of herbicide resistance in *Raphanus raphanistrum* revealed by comprehensive testing and statistical analysis. *Pest Management Science* doi: 10.1002/ps.8394

Cantila AY, Chen S, Siddique KHM, and Cowling WA (2024). Heat shock responsive genes in Brassicaceae: Genome-wide identification, phylogeny, and evolutionary associations within and between genera. *Genome* doi: 10.1139/gen-2024-0061

Cappaert R, Yang W, Ross DJ, Johnston C, MacLeod C, and White CA (2024). Development of an image binarization software tool for net occlusion estimations. *Aquacultural Engineering* **107** doi: 10.1016/j.aquaeng.2024.102466

Cervigni EM, Pires R, Trevenen EJ, Britton D, Waterhouse B, Royer JE, and Renton M (2024). Dynamic spatial network simulation accounting for multiple ecological factors provides practical recommendations for biosecurity early detection and rapid response (EDRR) strategies. *Pest Management Science* doi: 10.1002/ps.8507

Chamhuri N, Che Lah NS, Batt PJ, Ramlan MNB, Mod Asri N, and Abdullah Al-Hadi A (2024). Exploring consumer attitudes and behaviour towards sustainable health-related food choices. *British Food Journal* **126(2)** 920–937 doi: 10.1108/BFJ-07-2023-0612.

Chen G, Ran QX, Wang C, Pang J, Ren MJ, Wang ZY, He J, and Lambers H (2024). Enhancing photosynthetic phosphorus use efficiency through coordination of leaf phosphorus fractions, allocation, and anatomy during soybean domestication. *Journal of Experimental Botany* doi: 10.1093/jxb/erae427

Chen W, Bai D, Liao Y, Yu Q, Bai L, and Pan L (2024). PfGSTF2 endows resistance to quizalofop-p-ethyl in *Polypogon fugax* by GSH conjugation. *Plant Biotechnology Journal* doi: 10.1111/pbi.14491

Chen Y and Palta JA (2024) Editorial: Crop root system adaptation to hostile soils. *Plant & Soil* **502** 1–6 doi: 10.1007/s11104-024-06750-3

Considine MJ (2024). Quiescence and dormancy underpin plasticity and resilience: the virtue of being idle. *Journal of Experimental Botany* **75(19)** 6007–6010 doi: 10.1093/jxb/erae396

Dang H, Sun R, She W, Hou S, Li X, Chu H, Wang T, Huang T, Huang Q, Siddique KHM, and Wang Z (2024). Updating soil organic carbon for wheat production with high yield and grain protein. *Field Crops Research* **317** doi: 10.1016/j.fcr.2024.109549

de Tombeur F, Plouzeau L, Shaw J, Hodson MJ, Ranathunge K, Kotula J, Hayes PE, Tremblay M, Coq S, Stein M, Nakamura R, Wright IJ, Lambers H, Violle C, and Clode PL (2024). Anatomical and trait analyses reveal a silicon-carbon trade-off in the epidermis of sedges. *Plant, Cell & Environment* doi: 10.1111/pce.15307

Ding L, Colman ER, Wang Y, Ramachandran M, Maloney SK, Chen N, Yin J, Chen L, Lier EV, Blache D, and Wang M (2024). Novel pathways linked to the expression of temperament in Merino sheep: a genome-wide association study. *Animal* **18** doi: 10.1016/j.animal.2024.101279

Dolatbadian A, Neik TX, Danilevicz MF, Upadhyaya SR, Batley J, and Edwards D (2024). Image-based crop disease detection using machine learning. *Plant Pathology* doi: 10.1111/ppa.14006

Doquet-Chassaing S, and Batt PJ (2024). An exploratory examination of sustainable food purchasing by restaurants in Paris, France, by product category. *Journal of Agribusiness Marketing* **12(1)** doi: 10.56527/jabm.12.11

Farooq M, Rafique S, Zahra N, Rehman A, and Siddique KHM (2024). Root system architecture and salt stress responses in cereal crops. *Journal of Agronomy and Crop Science* **210** doi: 10.1111/jac.12776

Farooq M, Zahra N, Ullah A, Nadeem F, Rehman A, Kapoor R, Al-Hinani MS, and Siddique KHM. (2024). Salt stress in wheat: Effects, tolerance mechanisms, and management. *Journal of Soil Science and Plant Nutrition* doi: 10.1007/s42729-024-02104-1

Fu PL, Zhang Y, Qi JH, Zhang YJ, Hao GY, Finnegan PM, Yan QS, and Fan ZX (2024). The impact of elevated CO₂ concentration on photosynthesis, growth and hydraulics of evergreen and deciduous tree seedlings from a subtropical forest in Southwest China. *Agricultural and Forest Meteorology* **352** doi: 10.1016/j.agrformet.2024.110021

Gholamhoseini M, and Dolatabadian A (2024). Sesame renaissance: Iran's emerging influence in the global sesame market. *OCL - Oilseeds and Fats, Crops and Lipids* **31** doi: 10.1051/ocl/2024024

Gil M, Garcia F, Breccia G, Ochogavía AC, Nestares G, Gundel PE, Han H, Yu Q, Powles SB, and Vila-Aiub M (2024). Allelic interactions defining *Raphanus raphanistrum* AHAS resistance level: strong vs weak target-site AHAS resistance alleles. *Pest Management Science* doi: 10.1002/ps.8471

Goggin DE, Cawthray GR, and Busi R (2024). Interactions between prosulfocarb and trifluralin metabolism in annual ryegrass (*Lolium rigidum*). *Pest Management Science* doi: 10.1002/ps.8458

Gomez-Casanovas N, Blanc-Betes E, Bernacchi CJ, Boughton EH, Yang W, Moore C, Pederson TL, Saha A, and DeLucia EH (2024). Impact of sugarcane cultivation on C cycling in southeastern United States following conversion from grazed pastures. *Global Change Biology Bioenergy* **16** doi: 10.1111/gcbb.70003

Habanyati EJ, Paramasivam S, Seethapathy P, and Manali S (2024). Assessing organic farming adoption in selected districts of Tamil Nadu: Challenges, practices, and pathways for growth. *Agronomy* **14(11)**, 2537 doi: 10.3390/agronomy14112537

Haider FU, Virk AL, Nian L, Farooq M, Liu J, Yang M, Huang W, and Li Y (2024). Soil organic carbon and aggregate associated changes in three subtropical evergreen forest ecosystems of China. *Journal of Soil Science and Plant Nutrition* doi: 10.1007/s42729-024-02053-9

- He J, Jia Y, Li Y, Biswas A, Feng H, Yu Q, Wu S, Yang G, and Siddique KHM (2024). Regional-scale precision mapping of cotton suitability using UAV and satellite data in arid environments. *Agricultural Water Management* **307** doi: 10.1016/j.agwat.2024.109215
- He J, Palta JA, Jin Y, and Turner NC (2024). Interaction of phosphorus supply and water deficits on the yield, protein and oil content, and nitrogen fixation of soybean (*Glycine max* (L.) Merr.). *Advances in Agronomy* doi: 10.1016/bs.agron.2024.08.002
- He S, Tian J, Ouyang Y, Liao Y, Yu Q, Bai L, and Pan L (2024). Glyphosate resistance in *Eleusine indica*: Involvement of CYP71AK44 in addition to EPSPS gene overexpression. *Journal of Agricultural and Food Chemistry* **72** doi: 10.1021/acs.jafc.4c07765
- Hou M, Li Y, Biswas A, Chen X, Xie L, Liu D, Li L, Feng H, Wu S, Satoh Y, Pulatov A, and Siddique KHM (2024). Concurrent drought threatens wheat and maize production and will widen crop yield gaps in the future. *Agricultural Systems* **220** doi: 10.1016/j.agsy.2024.104056
- Hou S, Sun X, Chen G, Siddique KHM, Chen Z, Liu F, Ping S, Lai H, Guo H, An Y, Lin Z, Zhang Z, Sun L, and Yang P (2024). Biochar addition mitigates asymmetric competition of water and increases yield advantages of maize-alfalfa strip intercropping systems in a semiarid region on the Loess Plateau. *Field Crops Research* **319** doi: 10.1016/j.fcr.2024.109645
- Hou X, He W, Zhang Y, Zhang N, Yan J, and Chen Y (2024). Maize-straw biochar enhances soil properties and grain yield of foxtail millet in a newly reclaimed land. *Agronomy* **14** 2465. doi: 10.3390/agronomy14112465
- Jaffar MT, Zhen S, Han J, Zhang J, Dar A, Mushtaq Z, Hussain Q, Zahir ZA, and Siddique KHM (2024). Orange peel biochar: An effective amendment to improve the maize resilience by regulating the soil enzymatic activities, nutrient uptake, and ionic homeostasis under salinity stress. *Industrial Crops and Products* **222** doi: 10.1016/j.indcrop.2024.120081
- Jha UC, Priya M, Naik YD, Nayyar H, Thudi M, Punnuri SM, Siddique KHM, and Prasad PVV (2024). Major abiotic stresses on quality parameters in grain legumes: Impacts and various strategies for improving quality traits. *Environmental and Experimental Botany* **228** doi: 10.1016/j.envexpbot.2024.105978
- Jia Y, Li Y, He J, Biswas A, Siddique KHM, Hou Z, Luo H, Wang C, and Xie X (2024). Enhancing precision nitrogen management for cotton cultivation in arid environments using remote sensing techniques. *Field Crops Research* **321** doi: 10.1016/j.fcr.2024.109689
- Jia Y, Xu Z, Zhang D, Yang W, Ding Y, Li C, Gao L, Siddique KHM, and Qu Z (2024). Effects of a single biochar application on soil carbon storage and water and fertilizer productivity of drip-irrigated, film-mulched maize production. *Agronomy* **14** doi: 10.3390/agronomy14092028
- Kefelegn N, Benor S, Haile G, Fikre A, and Barbetti MJ. (2024). Agro-morphological characterization and comparative performance of Ethiopian and exotic lentil (*Lens culinaris Medik*) germplasm. *Genetic Resources and Crop Evolution* doi: 10.1007/s10722-024-02204-y
- Khan AA, Siddiqui Y, Siddique KHM, Bobo JA, and Ali A (2024). Minimizing postharvest food losses: A vital strategy to alleviate food insecurity and malnutrition in developing nations: A review. *Discover Food* **4** doi: 10.1007/s44187-024-00129-0
- Kierath D, O'Connor J, Leopold M, and Bolan NS (2024). Unearthing the impact of land use on deep soil carbon—An example from the southwestern Australian wheatbelt. *Soil Use and Management* **40** doi: 10.1111/sum.13121
- Kong F, Hu S, Wang R, Jiu A, Kan Z, Yang H, Palta JA, and Li FM (2024). Straw return under deep tillage increases grain yield in the rice-rotated wheat cropping system. *Field Crops Research* **317** doi: 10.1016/j.fcr.2024.109559
- Kotula L, Zahra N, Farooq M, Shabala S, and Siddique KHM (2024). Making wheat salt tolerant: What is missing? *The Crop Journal* **12** doi: 10.1016/j.cj.2024.01.005
- Lai H, Li X, Chen Y, and Liu Z (2024). Mitigating heat-induced yield loss in peanut: Insights into 24-epibrassinolide-mediated improvement in antioxidant capacity, photosynthesis, and kernel weight. *Field Crops Research* doi: 10.1016/j.fcr.2024.109521
- Li C, Lambers H, Jing J, Zhang C, Bezemer TM, Klironomos J, Cong WF, and Zhang F (2024). Belowground cascading biotic interactions trigger crop diversity benefits. *Trends in Plant Science* **29** doi: 10.1016/j.tplants.2024.04.010
- Li C, Zhang Y, Wang J, Feng H, Zhang R, Zhang W, and Siddique KHM (2024). Considering water-temperature synergistic factors improves simulations of stomatal conductance models under plastic film mulching. *Agricultural Water Management* **306** doi: 10.1016/j.agwat.2024.109211
- Lin N, Luo X, Wen J, Fu J, Zhang H, Siddique KHM, Feng H, and Zhao Y (2024). Black biodegradable mulching increases grain yield and net return while decreasing carbon footprint in rain-fed conditions of the Loess Plateau. *Field Crops Research* **318** doi: 10.1016/j.fcr.2024.109590
- Liu Z, Dong S, Liu Y, Li H, Zhou F, Ding J, Zhao Z, Chen Y, Zhang X, Chen Y, and Chen D (2024). Optimizing the *Bacillus thuringiensis* (Bt) protein concentration in cotton: Coordinated application of exogenous amino acids and EDTA to reduce spatiotemporal variability in boll and leaf toxins. *Journal of Integrative Agriculture* **23** doi: 10.1016/j.jia.2024.03.029
- Magar DBT, Pandit R, and Rola-Rubzen MF (2024). Drivers of overseas labour migration, migration intensity, and destination choice among farming households in Nepal. *Journal of Ethnic and Migration Studies* doi: 10.1080/1369183X.2024.2373311
- Mahfuza EJ, Alam MJ, and McKenzie AM (2024). Demand for milk and milk products in the rural household of Bangladesh: A panel data analysis. *Journal of Agricultural and Food Research* **18** doi: 10.1016/j.jafr.2024.101457
- Malik AI, Bell R, Zang H, Boitt G, and Whalley WR (2024). Exploring the plant and soil mechanisms by which crop rotations benefit farming systems. *Plant and Soil* doi: 10.1007/s11104-024-06994-z-z
- Matthews S, Siddiqui Y, and Ali A (2024). Unleashing the power of bio-stimulants for enhanced crop growth, productivity, and quality: A comprehensive review. *Journal of Plant Nutrition* doi: 10.1080/01904167.2024.2412736
- Mburu M, Mburu J, Nyikal R, Mugeru A, and Ndambi A (2024). Role of agricultural extension in learning for uptake and intensification of less-practiced dairy climate-smart practices in Kenya. *Cogent Food & Agriculture* **10(1)** doi: 10.1080/23311932.2024.2330182
- Michelini DF, Lattanzi FA, Rodríguez-Blanco A, Del Pino A, Piccin Torchelsen F, Lezama F, Pinelli V, Overbeck G, Inchausti P, Wasaki J, Teste FP, and Lambers H (2024). Phenotypic plasticity accounts for changes in plant phosphorus-acquisition strategies from mining to scavenging along a gradient of soil phosphorus availability in South American Campos grasslands. *Journal of Ecology* doi: 10.1111/1365-2745.14445
- Miller DW, Barnes AL, Collins T, Pannier L, Aleri J, Maloney SK, and Anderson F (2024). Welfare and performance benefits of shade provision during summer for feedlot cattle in a temperate climatic zone. *Journal of Animal Science* **102** doi: 10.1093/jas/skae332
- Mohamedikbal S, Al-Mamun HA, Marsh JI, Upadhyaya S, Danilevicz MF, Nguyen HT, Valliyodan B, Mahan A, Batley J, and Edwards D. (2024). Local haplotyping reveals insights into the genetic control of flowering time variation in wild and domesticated soybean. *The Plant Genome* doi: 10.1002/tpg2.20528
- Nguyen C, Latacz-Lohmann U and Hanley N (2024). Agri-environmental schemes require improved design for better outcomes. *Eurochoices* doi: 10.1111/1746-692X.1244
- Omar Z, Sailli AR, Abdul Fatah F, Aziz AS, Yusup Z, Rola-Rubzen MF, and Bujang AS (2024). Exploring the challenges of adopting smart farming in the agriculture sector among smallholders in Malaysia. *International Journal of Academic Research in Business and Social Sciences* **14(6)** doi: 10.6007/IJARBS/v14-i6/21810
- Ploschuk RA, Miralles DJ, Kavanová M, and Striker GG (2024). Identifying the numerical components affecting soybean (*Glycine max*) yield under waterlogging at reproductive stages. *Journal of Agronomy and Crop Science* **210** doi: 10.1111/jac.12764
- Prescott LA, Scholtens MR, Walker SP, Clarke SM, Dodds KG, Miller MR, Semmens JM, Carter CG, and Symonds JE (2024). Genetic parameters and genotype-by-environment interaction estimates for growth and feed efficiency related traits in Chinook salmon,

- Oncorhynchus tshawytscha*, reared under low and moderate flow regimes. *Genetics Selection Evolution* **63** doi: 10.1186/s12711-024-00929-z
- Puga G, and Anderson K (2024). The influence of climate on varietal similarities across countries. *Agricultural & Environmental Letters* **9** doi: 10.1002/ael2.70001
- Puga G, and Anderson K (2024). What explains changes in grape varietal mixes in Australia's wine regions? *Australian Journal of Agricultural and Resource Economics* doi: 10.1111/1467-8489.12594
- Qiao R, Song Z, Chen Y, Xu M, Yang Q, Shen X, Yu D, Zhang P, Ding C, and Guo H (2024). Planting density effect on poplar growth traits and soil nutrient availability, and response of microbial community, assembly and function. *BMC Plant Biology* **24**, 5648. doi: 10.1186/s12870-024-05648-7
- Quan H, Wu L, Sun J, Zhang T, Wu L, Siddique KHM, Feng H, and Wang B (2024). Film mulching can alleviate soil quality decrease and produce high maize yield under different irrigation strategies. *Agricultural Water Management* **306** doi: 10.1016/j.agwat.2024.10922
- Quan H, Wu L, Wang B, Feng H, Dong Q, Siddique KHM (2024). Incorporating canopy radiation enhances the explanation of maize yield change and increases model accuracy under film mulching. *European Journal of Agronomy* **158** doi: 10.1016/j.eja.2024.127198
- Rawlinson C, Nealon G, Chooi YH, Oliver RP, Moffat CS, and See PT (2024). Discovery of two novel phthalide phytotoxins from the wheat tan spot fungal pathogen *Pyrenophora tritici-repentis*. *Agricultural and Environmental Chemistry* **72** doi: 10.1021/acs.jafc.4c02533
- Raza A, Bhardwaj S, Rahman MA, Garcia-Caparrós P, Copeland RGR, Charagh S, Rivero RM, Gopalakrishnan S, Corpas FJ, Siddique KHM, and Hu Z (2024). Fighting to thrive via plant growth regulators: Green chemical strategies for drought stress tolerance. *Physiologia Plantarum* doi: 10.1111/ppl.14605
- Renton M, Willse A, Aradhya C, Tyre A, and Head G (2024). Simulated herbicide mixtures delay both specialist monogenic and generalist polygenic resistance evolution in weeds. *Pest Management Science* **80**(11) doi: 10.1002/ps.8331
- Sala S, Shimomura M, Tham L, Sakata J, Sobolev AN, Moggach SA, Fromont J, Gomez O, Piggott MJ, Tokuyama H, Stewart SG, and Flemmatti GR (2024). Semisynthetic studies establish a role for conjugate halide exchange in the formation of chlorinated pyrroloiminoquinones and related alkaloids. *Journal of Natural Products* **87** doi: 10.1021/acs.jnatprod.4c00549
- Sheikh AT, Chaudhary AK, Mufti S, Davies S, Rola-Rubzen MF (2023). Soil fertility in mixed crop-livestock farming systems of Punjab, Pakistan: The role of institutional factors and sustainable land management practices. *Agricultural Systems* **218** 1–12 doi: 10.1016/j.agsy.2023.104987
- Shen B, Wang H, He Q, He X, Liao X, Di D, Chen Q, and Shi W. (2024). Responses of forest soil respiration in the East Asian monsoon region to ENSO events *Plant and Soil* doi: 10.1007/s11104-024-07080-0
- Shi S, Wang X, Li H, Song J, He X, and Yang Z (2024). Species-dependent response of Brassica chinensis L. to elevated CO₂ gradients influences uptake and utilization of soil nitrogen, phosphorus and potassium. *Agronomy* **14**(8) doi: 10.3390/agronomy14081684
- Song Y, Weng Y, Liu S, Usman M, Looor JJ, Lin G, Hu Q, Luo J, and Wang P (2024). Effects of reduced levels of organic trace minerals in proteinate forms and selenium yeast in the mineral mix on lactation performance, milk fatty acid composition, nutrient digestibility, and antioxidant status in dairy goats. *Journal of Animal Science* **102** doi: 10.1093/jas/skae187
- Spencer-Cotton A, Kragt ME and Burton M (2024). Estimating the value of self-drive recreation in the remote Kimberley: Sensitivity to multi-destination trips. *Agricultural and Research Economics* doi: 10.1111/1467-8489.12584
- Sultana S, Foster KJ, Bates T, Lokman MD, Lim LY, Hammer K, and Locher C (2024). Estrogenic isoflavones in clover plants, flower nectar, unripe honeys, and mature honeys: A natural biochemical transformation of isoflavones by honeybees. *Foods* **13** (11) doi: 10.3390/foods1311739
- Sultana S, Foster KJ, Bates T, Lokman MD, Lim LY, Hammer K, and Locher C (2024). Determination of physicochemical characteristics, phytochemical profile, and antioxidant activity of various clover honeys. *Chemistry and Biodiversity* **21**(5) doi: 10.1002/cbdv.202301880
- Sultana S, Lawag IL, Lim LY, Foster KJ, and Locher C (2024). A critical exploration of the total flavonoid content assay for honey. *Methods & Protocols* **7** doi: 10.3390/mps7060095
- Sultana S, Lokman MD, Sostaric T, Lim LY, Foster KJ, and Locher C (2024). Investigating flavonoids by HPTLC analysis using aluminium chloride as derivatization reagent. *Molecules* **29**(21) 5161 doi: 10.3390/molecules29215161
- Suriyagoda L, Dandeniya WS, Kadupitiya HK, Madushan R, Senarathne S, and Chandrajith R (2024). Evaluation of Exchangeable Potassium Concentration in Sri Lankan Rice Paddy Soils with ICP-MS Using CaCl₂ Extraction. *Communications in Soil Science and Plant Analysis* **55** 3547–3561 doi: 10.1080/00103624.2024.2402807
- Tan Y, Cheng E, Feng X, Zhao B, Chen J, Xie Q, Peng H, Li C, Lu C, Li Y, Zhang B, and Peng D (2024). Application of APSIM model in winter wheat growth monitoring. *Frontiers in Plant Science* **15** doi: 10.3389/fpls.2024.1500103
- Tang Y, Rong H, Jia X, Chen Y, Wang Z, Wei J, Yang C, Liu J, Wang M, Yu H, and Wang Q (2024). Unveiling the molecular symphony: MicroRNA160a-Auxin Response Factor 18 module orchestrates low potassium tolerance in banana (*Musa acuminata* L.). *Plant Science* **350** doi: 10.1016/j.plantsci.2024.112288
- Tanveer M, Wang L, Huang L, Zhou M, Chen ZH, and Shabala S (2024). Understanding mechanisms for differential salinity tissue tolerance between quinoa and spinach: Zooming on ROS-inducible ion channels. *Crop Journal* **12** doi: 10.1016/j.cj.2024.03.001
- Tian Z, Zhang M, Liu C, Xiang, Y, Hu Y, Wang Y, Liu E, Wu P, Ren X, Jia Z, Siddique KHM, and Zhang P (2024). Optimizing fertilization depth to promote yield performance and economic benefit in maize for hybrid seed production. *European Journal of Agronomy* **159** doi: 10.1016/j.eja.2024.127245
- Tobias PA, Downs J, Epaina P, Singh G, Park RF, Edwards RJ, Brugman E, Zulkifli A, Muhammad J, Purwantara A, and Guest DI (2024). Parental assigned chromosomes for cultivated cacao provides insights into genetic architecture underlying resistance to vascular streak dieback. *The Plant Genome* doi: 10.1002/tpg2.20524
- Turner DW, Gibbs DJ, Ocimati W, and Blomme G (2024). A functional analysis of inflorescence architecture in *Musa* L. (Musaceae). *Food and Energy Security* **13** doi: 10.1002/fes3.70010
- Ul Hassan M, Hussain S, Adeel M, Ayub A, Kareem HA, Jabeen S, Saqib M, Wang Q, Yan M, Siddique KHM, and Tahir M (2024). Calcium oxide nanoparticles ameliorate cadmium toxicity in alfalfa seedlings by depriving its bioaccumulation, enhancing photosystem II functionality and antioxidant gene expression. *Science of The Total Environment* **955** doi: 10.1016/j.scitotenv.2024.176797
- Upadhyaya SR, Danilevicz MF, Dolatabadian A, Neik TX, Zhang F, Al-Mamun HA, Bennamoun M, Batley J, and Edwards D (2024). Genomics-based plant disease resistance prediction using machine learning. *Plant Pathology* doi: 10.1111/ppa.13988
- Velásquez C, Cancino-Baier D, Quiñones-Díaz J, Huaiquipan R, Muñoz A, Sepúlveda Becker N, Díaz R, Paz EA, Velázquez L, Sepúlveda G, Tapia D, and Olivares F (2024). In the search for pastoral livestock systems that improve the meat quality: An exploratory study. *Renewable Agriculture and Food Systems* doi: 10.1017/S1742170524000127
- Wahab A, Muhammad M, Munir A, Abdi G, Zaman W, Ayaz A, Khizar C, and Reddy SPP (2024). Role of arbuscular mycorrhizal fungi in regulating growth, enhancing productivity, and potentially influencing ecosystems under abiotic and biotic stresses. *Plants (Basel)* **12**(17) doi: 10.3390/plants12173102
- Wang C, Tai H, Chen Y, Zhai Z, Zhang L, Pu Z, Zhang M, Li C, and Xie Z (2024). Soil microbiota modulates root transcriptome with divergent effect on maize growth under low and high phosphorus inputs. *Plant, Cell & Environment* doi: 10.1111/pce.15281
- Wang C, Wei Xu L, Xia Ran Q, Pang J, Lambers H, and He J (2024). Crop domestication increased photosynthetic phosphorus-use efficiency associated with changes in leaf phosphorus fractions under low soil phosphorus conditions. *Plant and Soil* doi: 10.1007/s11104-024-06898-y

- Wang N, Chu X, Li J, Luo X, Ding D, Siddique KHM, and Feng H (2024). Understanding increased grain yield and water use efficiency by plastic mulch from water input to harvest index for dryland maize in China's Loess Plateau. *European Journal of Agronomy* doi: 10.1016/j.eja.2024.127402
- Wang Q, Ding J, Zhang Z, Liang C, Lambers H, Zhu B, Wang D, Wang J, Zhang P, Li N, and Yin H (2024). Rhizosphere as a hotspot for microbial necromass deposition into the soil carbon pool. *Journal of Ecology* doi: 10.1111/1365-2745.14448
- Wang W, Yang Z, Gu X, Muger A, and Yin N (2024). How farm machinery rental services and off-farm work affect household income in China. *Agriculture-Base* **14** doi: 10.3390/agriculture14101672
- Wang X, Cheng L, Xiong C, Whalley WR, Miller AJ, Rengel Z, Zhang F, and Shen J (2024). Understanding plant-soil interactions underpins enhanced sustainability of crop production. *Trends in Plant Science* **29** doi: 10.1016/j.tplants.2024.05.008
- Wang X, Qian R, Han Y, Ji Z, Yang Q, Wang L, Chen X, Ma K, Siddique KHM, Jia Z, and Ren X (2024). Straw return can increase maize yield by regulating soil bacteria and improving soil properties in arid and semi-arid areas. *European Journal of Agronomy* **161** doi: 10.1016/j.eja.2024.127389
- Wawrzyczek SK, Davis RA, Krauss SL, Hoebee SE, and Phillips RD (2024). Does pollination by non-flying mammals contribute substantially to fruit set of *Banksia* (Proteaceae)? A test in four species with contrasting floral traits. *Botanical Journal of the Linnean Society* **61** doi: 10.1093/botlinnean/boae061
- Wen S, Dang P, Li D, Qin X, and Siddique KHM (2024). Effects of semi-film and full-film mulching on soybean growth, biological nitrogen fixation and grain yield. *Journal of Agronomy and Crop Science* doi: 10.1111/jac.12724
- West SC, Muger AW, and Kingwell RS (2024). What drives the overall technical efficiency of farm businesses in the Wheatbelt of Western Australia? Analysis of persistent and transient efficiencies in the presence of firm effects. *Australian Journal of Agricultural and Resource Economics* **2024** doi: 10.1111/1467-8489.12593
- Wisdom JJM, Kidd DR, Ryan MH, Barbour L, Hockey A, Cawthray GR, and Foster KJ (2024). Can strategic integration of cultivated pasture legumes into temperate agricultural systems provide stability to honey bee populations and associated industries? *Plants, People, Planet* doi: 10.1002/ppp3.10591
- Wu J, Yu H, Zhang Y, Zhao H, Zhong B, Yu C, Feng Z, Yu H, and Li H (2024). Pathological characteristics of SRY-negative 38,XX-DSD pigs: A family case report. *Animal Reproduction Science* **270** doi: 10.1016/j.anireprosci.2024.107579
- Wu L, Quan H, Wu L, Zhang X, Ding D, Feng H, Siddique KHM, Liu DL, and Wang B (2024). Plastic mulching enhances maize yield and water productivity by improving root characteristics, green leaf area, and photosynthesis for different cultivars in dryland regions. *Agricultural Water Management* **305** doi: 10.1016/j.agwat.2024
- Wu W, Li Y, Manevski K, Andersen MN, Si B, Lou Y, Feng H, and Siddique KHM (2024). Transpiration and water use strategies of three economic tree species in a semi-arid afforestation region. *European Journal of Forest Research* doi: 10.1007/s10342-024-01740-7
- Xu LW, Pang J, Turner NC, Lambers H, and He J (2024). Genotypic differences in soybean (*Glycine max* L.) in yield response to phosphorus fertilizer are associated with difference in biomass and phosphorus content. *Journal of Agriculture and Food Research* **18** doi: 10.1016/j.jafr.2024.101267
- Xu Y, Liu S, Finnegan PM, Liu F, Ali I, Zhang H, and Yang M (2024). Geographical variation and genetic diversity of *Parashorea chinensis* germplasm resources. *Frontiers in Plant Science* **15** doi: 10.3389/fpls.2024.1452521
- Yang X, Li X, Wang X, Chen C, Wu D, Cheng Y, Wang Y, Sha L, Kang H, Liu S, Fan X, Chen Y, Zhou Y, and Zhang H. (2024). Genome-wide identification and characterization of bZIP gene family explore the responses of PsebZIP44 and PsebZIP46 in *Pseudoroegneria libanotica* under drought stress. *BMC Plant Biology* **24**, 1085. doi: 10.1186/s12870-024-05809-8
- Yu M, Shi W, Liang Y, and Shabala S. (2024). Hormonal regulation of plant adaptation to hostile soils. *Plant and Soil* doi:10.1007/s11104-024-07065-z
- Yun P, Kaya C, and Shabala S (2024). Hormonal and epigenetic regulation of root responses to salinity stress. *The Crop Journal* **12** doi: 10.1016/j.cj.2024.02.007
- Zahedi SM, Karimi M, Venditti A, Zahra N, Siddique KHM, and Farooq M (2024). Plant adaptation to drought stress: The role of anatomical and morphological characteristics in maintaining the water status. *Journal of Soil Science and Plant Nutrition* doi:10.1007/s42729-024-02141-w
- Zhang B, Guo J, Fang H, Wu S, Feng H, and Siddique KHM (2024). Soil erosion projection and response to changed climate and land use and land cover on the Loess Plateau. *Agricultural Water Management* **306** doi: 10.1016/j.agwat.2024.109187
- Zhang M, Yang N, Wang S, Han X, Dang P, Li G, Wen S, Zhang L, Xue J, Qin X, and Siddique KHM (2024). Straw returning and nitrogen reduction: Strategies for sustainable maize production in the dryland. *Journal of Environmental Management* **366** doi: 10.1016/j.jenvman.2024.121837
- Zhao C, Siddique AB, Guo C, Shabala S, Li C, Chen Z, Varshney R, and Zhou M (2024). A high-throughput protocol for testing heat-stress tolerance in pollen. *aBIOTECH* doi: 10.1007/s42994-024-00183-3
- Zhao S, Zhang Q, Huang Q, Zhang C, Li H, and Siddique KHM (2024). Polyvinyl chloride microplastics disseminate antibiotic resistance genes in Chinese soil: A metagenomic analysis. *Journal of Hazardous Materials* **479** doi: 10.1016/j.jhazmat.2024.135727
- Zhou L, Han X, Yang Q, Feng H, and Siddique KHM (2024). Optimizing sowing date to mitigate loss of growing degree days and enhance crop water productivity of groundwater-irrigated spring maize. *Agricultural Water Management* **305** doi: 10.1016/j.agwat.2024.109097
- Zulfiqar S, Aslam MM, Ditta A, Iqbal R, Mustafa AEM, Elshikh MS, Uzair M, Aghayeva S, Qasim M, Ercisli S, Simsek O, Izgu T, and Zhao P (2024). Evaluation of genetic diversity and population structure of the Chinese chestnut (*Castanea mollissima*) by using NR-SSR markers. *Genetic Resource Crop Evolution* doi: 10.1007/s10722-024-02107-y

Book chapter

Amandeep GS, Singh I, Gill RK, Sharma P, Pratap A, Gupta S, Nayyar H, and Siddique KHM (2024). Back to Wild: Designing Future Climate-Resilient Cultivars of Urdbean and Mungbean. In: (Eds) Jha UC, Nayyar H, Sharma KD, von Wettberg EJB, and Siddique KHM (2024). *Legume Crop Wild Relatives: Their Role in Improving Climate Resilient Legumes*. CRC Press Taylor and Francis Group, London and New York

Book

Jha UC, Nayyar H, Sharma KD, von Wettberg EJB, and Siddique KHM (2024). *Legume Crop Wild Relatives: Their Role in Improving Climate Resilient Legumes*. CRC Press Taylor and Francis Group, London and New York

UPCOMING EVENT

2025 Postgraduate Showcase: Frontiers in Agriculture

Wednesday 28 May

Location TBC



Register to attend our events on Eventbrite

IOA MISSION

To develop and communicate innovative evidence-based solutions for ethical food production, environmental sustainability and agribusiness advancement.



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

The UWA Institute of Agriculture acknowledges the contribution of The FA Hadley Bequest and The WE Rischbieth Bequest for support towards communications activities.