



UWA Farm Ridgefield Open Day attendees visiting a research demonstration site at Upper Cow Dam.

Crowds experience research first-hand at UWA Farm Ridgefield Open Day

UWA Farm Ridgefield was a hive of activity during its recent 2021 Open Day showcasing innovative research and development on 'Pastures and Fodder for Sustainability'.

About 130 community members and leaders, farmers, researchers, students and industry representatives flocked to West Pingelly to learn first-hand about four UWA research projects underway at the farm.

Noongar Elder Garry Bennell presented the Welcome to Country, followed by an introductory speech from The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique.

In her opening address, Shire of Pingelly Deputy President Jackie McBurney celebrated the long-standing and productive working relationship between UWA and the Pingelly community.

After feasting on a fundraiser lunch catered by the Pingelly Tourism Group, attendees boarded coaches to visit the Land Restoration Demonstration Site.

"Congratulations to all the presenters – their feet on the ground and practical extension at the farmer level is to be commended."

UWA Emerita Professor Lynette Abbott established the site to show how upscaling novel soil restoration practices can re-establish productivity on degraded areas of farmland.

Next on the itinerary was the 'Enrich' Forage Systems research project led by the Institute's Associate Director Professor Phillip Vercoe.

Against the backdrop of sheep grazing on native shrubs, Professor Vercoe explained that selecting perennial plant species with high nutritive value and low methanogenic potential had shown to improve year-round productivity and reduce the environmental footprint.

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Director's Column

As 2021 draws to a close, it is an important time for The UWA Institute of Agriculture to give thanks to our collaborators and supporters, reflect on challenges, and celebrate another outstanding year of growth.



A fitting metaphor for this period is the once-in-a-lifetime harvest currently underway across the great state of Western Australia.

Due to the combined good fortune of high yields, quality and prices – WA is set to harvest a record-breaking 21 million tonnes of grains worth up to \$9 billion. This is a truly tremendous result.

Counted among our many event highlights this year was the UWA Farm Ridgefield Open Day (pages 1 and 2), which celebrated four current research projects focused on Pastures and Fodder for Sustainability at the farm. My sincere thanks and congratulations to the researchers, student volunteers and team members who helped make the day such a triumph.

The Institute was extremely fortunate to welcome Cara Peek to deliver her lecture at UWA just one day after accepting the national AgriFutures 2020 Rural Women's Award (page 11), it was very rewarding to attend the recent Shenton Park Field Station Staff Open Day (page 13), the second CSIRO-UWA joint research seminar was a resounding success (page 14), and we were pleased to partner with AgZero2030 for its event at The University Club of Western Australia focused on how we can navigate the net zero transition (page 15).

There are many congratulations in order. The Non-Mulesing Producer Demonstration Site Project at Ridgefield has been recognised by RSPCA WA (page 3) and the School of Molecular Sciences Dr Joanna Melonek is most deserving of her recent awards (page 5).

In addition, the Centre for Agricultural Economics and Development was recently launched at UWA (page 8), the Institute's research theme co-leader Dominique Blache has been appointed Associate Professor (page 12), and I wish to make special mention of the UWA researchers in agriculture and related areas who were honoured on the prestigious 2021 Clarivate Highly Cited list (page 19).

I am greatly looking forward to another productive and rewarding year in 2022. Thank you very much to our Industry Advisory Board, Institute Management Board, Research Theme Leaders, committees, Institute members and staff for their hard work and dedication.

I wish you and your loved ones my best wishes for a happy and healthy New Year.

Hackett Professor Kadambot Siddique
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Dr Kevin Foster captured the crowd's attention with his collaborative research into oestrogenic subclover – detailing how to identify different varieties on-farm, their livestock impact, and remediation.

"We have been conducting pasture surveys across southern Australia to identify how widespread some of the older subclover varieties known to contain oestrogenic compounds are in these grazing areas," Dr Foster said.

The final stop was The Avon River Critical Zone Observatory, one of five core sites that make up the new OZCZO-network across Australia.

Dr Matthias Leopold explained that critical zone science was a holistic approach to study our environment "from the top of the tree canopy down to the bedrock".

The Pingelly Tourism Group had a full spread of baked goods and hot drinks waiting when everyone returned to the Old Farmhouse.



Emerita Professor Lynette Abbott with UWA student volunteers at the Land Restoration Demonstration Site.

Attendee feedback was extremely positive, with retired farmer John Hicks praising the Institute for its "exceptional hospitality" in hosting the Open Day.

"Congratulations to all the presenters – their feet on the ground and practical extension at the farmer level is to be commended," Mr Hicks said.



Professor Phil Vercoe presenting on 'Enrich' Forage Systems.

Ridgefield project recognised by RSPCA WA

RSPCA WA has recognised the Non-Mulesing Producer Demonstration Site Project at UWA Farm Ridgefield for its “positive influence on animal welfare” with the 2021 Agriculture Award.

The Meat & Livestock Australia-funded joint project between UWA and Georgia Reid and Ed Riggall at AgPro Management demonstrates the impact of shifting to non-mules for both producers and the wider industry.

UWA Farm Ridgefield has not mulesed for more than 10 years.

It is one of six sites where performance is measured – including weaner weight, wool value, animal price and husbandry costs.

With this data, farmers will be able to compare the benefit and cost with traditional management.

The research team is also capturing qualitative data to analyse the social impact and changes required to management.

Future Farm 2050 Project founder Emeritus Professor Graeme Martin said the RSPCA WA award honoured the “brave

decision” taken by UWA Farm Ridgefield former manager Kristy Robertson back in 2010.

“It had long been clear that mulesing would end at some stage, with highly visible campaigns by animal rights groups that, justifiably, labelled it as unacceptable,” Professor Martin said.

“Kristy knew there would be challenges in every blow-fly season, but she knew we had to change –and the originators of the concept of ‘clean, green and ethical management’.

“To see AgPro Management pass on what we have learned to other sheep farmers is the perfect outcome. The farmers who have engaged in the project are all very enthusiastic and committed to the welfare of their animals and to an industry with a better image.”

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Emeritus Professor Graeme Martin accepting the award from RSPCA WA Chair Lynne Bradshaw AM.

Workshop paves way for research and development at Ridgefield

The UWA Institute of Agriculture recently held a workshop to assist with developing a new Strategic Plan 2022-2027 for the Future Farm 2050 Project based at UWA Farm Ridgefield.

The October workshop was led by external consultant Dr Andy Paterson and attended by key stakeholders including UWA Emeritus Professor Graeme Martin, Pro Vice-Chancellor (Research) Professor

Andrew Page, Pingelly farmer Tim Watts, Institute Advisory Board member Bruce Mullan, Shire of Pingelly CEO Andrew Dover, and four of the Institute’s Research Theme leaders.



Key stakeholders following the workshop at the UWA Barry J Marshall Library.

The aim of the workshop was to reflect on what the FF2050 Project has achieved since its inception in 2009, and to consider what improvements could be made into the future.

The Institute’s Director Hackett Professor Kadambot Siddique said the process was extremely positive.

“The workshop identified several areas which we can actively improve upon, and there was clear support for significant changes,” Professor Siddique said.

The new Strategic Plan is currently under review and expected to be launched in early 2022.

Dedicated dung beetle team on a roll at UWA

Many people know that dung beetles were first introduced to Australia to clean away dung lying on pastures.

However, more than 50 years later, we still don't know the true economic value dung beetles have given the country.

School of Biological Sciences and The UWA Institute of Agriculture Associate Professor Theo Evans is leading research into quantifying how Australian agriculture has benefited from the importation of exotic dung beetles.

"Livestock dung remaining on pastures can be a problem for both farmers and the general public," Associate Professor Evans said.

"Dung left on pasture reduces the amount of feed available for livestock and provides a breeding ground for bushflies.



"Although the importation of exotic dung beetles to Australia is considered an example of a successful biocontrol program, we have surprisingly little information to quantify this."

In 2018, UWA was part of a consortium awarded funding from the Federal Government Rural R&D program and Meat & Livestock Australia to establish the Dung Beetle Ecosystem Engineers project.

A key part of this project was attempting to understand how the activity levels of dung beetles varied across seasons and the landscape.

To understand the benefits of dung beetles, School of Biological Sciences Research Associate Jacob Berson said we first need to know where they are found and when they are active.

"We've assembled a 'crack' dung beetle sorting team at UWA."

For the past three years, project partners have conducted monthly trapping for dung beetles at sites spread across the southern region of Australia.



Dr Jacob Berson setting up a dung beetle trap in Serpentine, WA.

UWA researchers have been identifying and counting the beetles caught in their traps.

"We've assembled a 'crack' dung beetle sorting team at UWA," Dr Berson said.

"We were really pleased that the expertise of this team has been recognised by the awarding of additional funds so that we can continue to process the thousands of samples collected throughout Australia."

Dr Berson was quick to highlight the collaborative nature of the project.

"The amount of data collected would not be possible without the dedication of private landholders, farmer groups and natural resource management groups conducting trapping at more than 120 locations across southern Australia," he said.

Trapping of dung beetles is expected to be completed in the first half of 2022, with results expected shortly after.

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Securing WaterSmart Farms in a drying climate

The WaterSmart Farms (WSF) project is surging ahead with help from its UWA project leader Associate Professor Nik Callow.

WSF is an initiative that seeks to ensure farmers have the tools and knowledge about water to run their businesses.

Associate Professor Callow sits on the WSF Industry Reference Group as the research organisation representative, with the first meeting held in Narrogin in October.

"A key message from the industry representatives was the need to plan in

the wet and good years such as 2021, for the next dry years that are just around the corner," Associate Professor Callow said.

"The South-West WA agricultural region has 200,000 farm dams and represents an investment by growers of over \$10 billion.

"Growers have reported that across the dry period of 2018-2020, between 25 per cent and 100 per cent of farm dams on their properties dried up," he said.

Researchers from The UWA Institute of Agriculture, UWA School of Agriculture and Environment, and newly formed Centre

for Water and Spatial Sciences are now working to find solutions on how to make dams work again in a drying climate.

The WA Government provided \$1.5M over three years to fund Phase 1 of WSF, focused on climate-independent water options, including on-farm groundwater desalination.

UWA has partnered with Department of Primary Industries and Regional Development (DPIRD) and the Grower Group Alliance (which heads the South-West WA Drought Resilience Adoption and Innovation Hub) to look at ways to provide surface water solutions to growers.

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Dr Joanna Melonek with her 2021 Western Australian Young Tall Poppy Science Award. Photo: Rosanna Candler

Sky's the limit for WA Young Tall Poppy

In the space of a handful of days, UWA's School of Molecular Sciences Dr Joanna Melonek was honoured with two prestigious awards in science.

No sooner had she begun celebrating her 2021 Western Australian Young Tall Poppy Science Award from the Australian Institute of Policy and Science in mid-September, Dr Melonek was surprised with yet another accolade – the Peter Goldacre Award from The Australian Society of Plant Scientists.

The Research Fellow at the ARC Centre of Excellence in Plant Energy Biology said she was happy and deeply honoured to accept the awards.

"On a professional level, it was great to receive a confirmation from my peers and the broader plant scientific community that they find my work interesting," Dr Melonek said.

"Of course, this all would not have been possible without the support from many people who accompany me on my scientific journey, and I'm very grateful to all of them for that."

Dr Melonek's research is focused on understanding a biological phenomenon called cytoplasmic male sterility (CMS) and fertility restoration by a group of genes referred to as restorer-of-fertility genes.

"CMS is an intriguing example of mitochondrial-nuclear genome interactions that are integral to the process of speciation by natural selection," she explained.

"Interestingly, this phenomenon has excellent practical benefits and is used in plant breeding to develop hybrid seed production systems."

Currently, Dr Melonek and her collaborators are developing a hybrid seed production system in wheat, which will provide a significant economic benefit to Australian and global wheat farmers.

"Of course, this all would not have been possible without the support from many people who accompany me on my scientific journey, and I'm very grateful to all of them for that."

She said it was a "fantastic feeling" to work on a project with real-life applications.

"I'm very passionate about it because I hope that my work one day may contribute to better food security around the world and in Australia, and that is something that motivates me a lot," she said.

One of the greatest achievements of Dr Melonek's scientific career was identifying three genes that will help to develop hybrid breeding systems in wheat.



Dr Mark Waters presenting Dr Joanna Melonek with the Peter Goldacre Award.

"We were trying to find those genes for some time, and it felt like we were looking for a needle in a haystack due to an extraordinary complexity of the wheat genome," she said.

"Therefore, when one day our collaborators sent us a picture of plants showing the phenotype that we were looking for, we were ecstatic."

Dr Melonek said she looked forward to continuing her work alongside Professor Ian Small and other world-leading researchers.

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Feast of Ideas provides food for thought

A self-taught baker, internationally renowned agricultural scientist, and artisan chocolatier made for the perfect recipe of speakers at the TEDxUWASalon Feast of Ideas.

The TEDxUWA movement aims to bring the spirit of TED to the UWA community by organising events that are focused on the power of ideas to change. About 90 people attended the Feast of Ideas event at UWA Hackett Cafe in September.

The first speaker of the evening was Croff Bakehouse co-founder Giselle Sim – a former accountant turned self-taught baker who has quickly built a cult croissant following.

Following refreshments catered by former MasterChef Australia contestant Brendan Pang, the Executive Director of Nakamura Chocolates Australia Yuki Nakamura took to the stage.

Ms Nakamura explored her personal relationship with food and offered a new, increasingly mindful way to eat, which she dubbed The Ceremony of Food.

The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique delivered a rousing speech on how we can mitigate worldwide hidden hunger and food insecurity with Future Smart Foods.

Professor Siddique traced the history of the Green Revolution and how it sparked



Yuki Nakamura, Giselle Sim and Hackett Professor Kadambot Siddique with TEDxUWA volunteers.

a significant increase in the production of food crops.

“Despite the existence of nearly seven thousand species of cultivated crops worldwide, just three staple crops (rice, wheat and maize) provide 60 per cent of the world’s food energy intake,” he told the 90-strong audience.

“At the current rate, it is estimated that one third of today’s already low crop diversity could disappear by 2050.

“Sometimes the best solutions are the simplest ones. Future Smart Foods are diverse and nutritionally rich, able to

stand up against the perilous impacts of climate change, economically viable and locally adapted.”

Professor Siddique cautioned that the “battle to beat world hunger” needed to be fought on many fronts.

“A key battleground is the diversification of our food production, and Future Smart Foods are essential to this,” he said.

“Nutritious and sufficient food, all year, for all people. That is worth fighting for.”

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All eyes on ‘ground-breaking’ virtual fencing trial



Professor Phil Vercoe pictured with cattle wearing the collars at Hamersley Station.
Photo: James Liveris (ABC)

A field day focused on BeefLinks’ pioneering WA-based virtual fencing technology research attracted the attention of national media.

Held at the Rio Tinto-owned Hamersley Station and organised by West Midlands Group, the BeefLinks Field Day in August was attended by dozens of pastoralists, industry leaders and stakeholders – including a TV crew from ABC’s Landline.

The segment ‘Farming without fences the future of agriculture’ aired in October.

BeefLinks is a four-year collaborative research and development (R&D) partnership involving Meat & Livestock Australia, MLA Donor Company and UWA.

Record-breaking return for Dowerin Field Days

The 2021 Dowerin GWN7 Machinery Field Days smashed previous attendance records with more than 24,800 people coming through the gates over two days.

After the 2020 event was cancelled due to COVID-19, crowds returned in droves – making this year the biggest field days in two decades.

The increased popularity was certainly felt at The UWA Institute of Agriculture's information stall within the DPIRD Shed.

UWA senior research officers Daniel Kidd and Roberto Lujan Rocha, Research Associate Dr Joanne Wisdom and Communications Officer Rosanna Candler were kept very busy speaking with interested farmers, researchers, students and industry representatives.

The colourful stall featured information on the Institute's Research Themes, Black Soldier Fly Project, UWA Farm Ridgefield, Australian Herbicide Resistance Initiative (AHRI) and more.



SAgE staff and students posing in front of the Institute's stall.

It aims to deliver an integrated and complementary R&D program for northern and southern production systems across WA that achieves profitable, consistent and sustainable beef yields matched to consumer expectations.

The virtual fencing trial includes 100 head of cattle wearing special GPS collars that are programmed to receive signals from a remote tower and guide animals away from a virtual fence line.

The next stage will be increasing the trial to 500 cattle, and then an entire breeding herd.

Professor Vercoe said a core research focus of the BeefLinks program was how to manage animals to better transition them

across different feed types to avoid any dip in productivity down the supply chain.

"The research is targeted on understanding how animals utilise the rich diversity of WA rangeland plants by looking at where animals go, what they eat when they are there and the nutritional value of what they are eating," he explained.

"We are not just linking the projects and development activities, but also communication amongst the people involved – from producers to processors."

The end goal of the virtual fencing trial is to change WA laws and allow for the collars to be made commercially available for WA pastoralists and graziers.



The Hon Minister Alannah MacTiernan speaking with Hackett Professor Kadambot Siddique.

In the lead-up to the event, Dr Kidd grew canola, wheat, clover, rye grass and chickpea plants – which were displayed alongside cards expanding on current UWA research involving each crop.

On the first day, the team was joined by the Institute's Director Hackett Professor Kadambot Siddique and a busload of energetic agriculture students from the UWA School of Agriculture and Environment (SAgE).

During her visit to the stall, The Honourable Minister for Regional Development, Agriculture and Food and Hydrogen Industry Alannah MacTiernan MLC was especially interested in discussing the Black Soldier Fly Project.

The collaborative research project between UWA, Future Green Solutions and Australian Pork aims to transform agricultural wastes into valuable commodities.

The Honourable Minister for Agriculture and Food Alannah MacTiernan recently threw her support behind virtual fencing technology.

"It is clearly an important step forward in improving a sustainable livestock industry," Ms MacTiernan told the Countryman.

"We have committed to modernising our animal welfare laws to allow more flexibility in approvals."

For more information, visit the [BeefLinks](https://beeflinks.com.au) website.

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New UWA research centre to tackle biggest challenges facing agriculture



Associate Professor Fay Rola-Rubzen, Associate Professor Marit Kragt and Dr Fiona Dempster.

The new Centre for Agricultural Economics and Development (CAED) at UWA is one of the largest centres of its kind in Australia.

The CAED was launched by UWA Deputy Vice-Chancellor (Research) Professor Tim Colmer and Head of the UWA School of Agriculture and Environment Associate Professor James Fogarty at a special event attended by close to 100 industry and university leaders in October.

Director Associate Professor Marit Kragt said the centre would operate as a leading Australian think-tank for economic research and policy advice related to agriculture, agri-environmental management, agribusiness and food systems.

“The research team will work closely with experts from The UWA Institute of Agriculture and the UWA School of Agriculture and Environment to address some of the biggest challenges facing agriculture around the world,” Associate Professor Kragt said.

“The Institute is a key collaborator with many of our team members involved in the Centre’s grants.

“There will be a distinct focus on research that is grounded in real world on-farm applications. Our aim is to deliver independent, evidence-based information to enhance decision making and the social, economic and environmental sustainability and resilience of farming systems and food supply chain participants, in developed and developing countries.”

Deputy directors of the Centre are UWA agricultural and development economist Associate Professor Fay Rola-Rubzen, who leads the international programs, and Research Fellow and grains-livestock farmer Dr Fiona Dempster, who leads the industry engagement.

The Centre will be staffed by 15 academics, as well as numerous Master’s, and PhD students in Agricultural Economics and International Development.

The most recent grant awarded to the Centre is Australian Research Council (ARC)’s Industrial Transformation Training Centre for Behavioural Insights for Technology Adoption, which will help fund up to four postgraduate research students commencing in 2022.

Farmers, internationally-renowned researchers, and leading industry and government advisors will sit on the Advisory Committee to provide independent, external advice on the Centre’s core activities.

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Institute leaders having a field day

A busy three days of field tours to the northern agricultural region of WA was the ideal opportunity to get out-and-about for The UWA Institute of Agriculture leaders.

At the Mingenew-Irwin Group’s Heavy Land Field Walk in early September, the Institute’s Director Hackett Professor Kadambot Siddique presented on ‘Pulses in farming systems’ followed by the Institute’s Associate Director Professor Wallace Cowling on ‘Breeding heat-tolerant canola’.

Professor Siddique said he and Professor Cowling visited interesting trials on pulses, canola, pastures, wheat and barley.

“I was especially pleased to speak with farmers and industry groups on various issues related farming systems in the region,” he said.



Dr Mark Sweetingham, Daniel Birch, Professor Wallace Cowling, Rod Birch and Hackett Professor Kadambot Siddique in the field.

The next day, the pair travelled to Geraldton to tour the canola National Variety Trials (which included some lines developed by Professor Cowling and funded by NPZ Germany) and GRDC-funded canola heat tolerance field experiments near Dongara.

Last on the program was a visit to the Institute’s Industry Advisory Board member Rod Birch’s farms in Coorow.

“Rod is one of the most innovative farmers in WA,” Professor Siddique said.



The 2021 UWA Soil Science group at Thurling Green. Photo: Liena Bond

Dig in to world class soil science at UWA

The diversity of soil science and plant nutrition at The University of Western Australia was clear to see during their annual group photo in September.

To celebrate another successful year, we asked research and teaching staff the following question: *What soil science research excites you the most and why?*



**Associate
Professor
Louise
Barton**

"Utilising new and emerging soil science knowledge to lower the nitrogen and carbon footprints of agriculture and horticulture, whilst improving water and nutrient efficiency, is currently keeping me busy! This includes providing up-to-date nitrous oxide data for agriculture carbon accounting, working alongside Dr Sasha Jenkins to characterise soil methane oxidation in our unique semiarid soils, and collaborating with Dr Khalil Kariman to investigate novel opportunities to use soil biology to improve water use efficiency in turfgrass production and maintenance."

"Whoever could make two ears of corn, or two blades of grass grow upon a spot of ground where only one grew before, would deserve better of mankind."

Dr Jonathon Swift



**Professor
Nanthi
Bolan**

"I am excited about research on soil health and crop productivity nexus. With continued decline in the land area available for cultivation, food security can be achieved only by safeguarding soil health in terms of its physical, biological and chemical fertility. Myself and my research team have been passionate about identifying the causes for the decline in soil health and developing innovative technologies and products to improve soil health to achieve food security."



**Associate
Professor
Deirdre
Gleeson**

"As a soil microbial ecologist, I am interested in microbes in soil – what they are doing and how we can better understand them. I am excited by the advances we are making in this space – it is one of the fastest moving areas of soil science with new technologies allowing us to open the microbial black box and really catch a glimpse of the microbial world underneath our feet."



**Dr
Andrew
Rate**

"I get most excited by research into contaminated urban soils. Addressing soil pollution is embedded in the United Nations' Sustainable Development Goals, and with more than half of humanity already living in urbanised areas, it's important that we understand soil contamination. Research in this area also lets me indulge some other passions, such as field work near coffee shops, involving students in research, and multivariate and spatial data analysis."



**Associate
Professor
Matthias
Leopold**

"I see soils as the often-hidden zone that sustains most of terrestrial life. My research bridges gaps from the small laboratory scale to the landscape scale by using various tools such as shallow geophysical methods to display 3D-water distribution, rooting zones, constraining layers or different soil horizons. I use a holistic approach to better understand soils in the natural environment as well as under agricultural usage which includes, basic soil descriptions, mapping and physico-chemical analysis and often collaborate with soil biologists."

Forrest Research Foundation Scholar predicting crop performance



A drone image of one of the field experiments. Photo: Roberto Lujan Rocha

Forrest Research Foundation Scholar Monica Danilevicz is on a mission to support crop breeders and growers make better-informed decisions in the field.

With guidance from her PhD supervisor Professor Dave Edwards, who leads the Applied Bioinformatics Group at UWA, Ms Danilevicz is leading two projects that use images collected by drones to train artificial intelligence models to accomplish their goals.

“The first project is aimed to help breeders select the highest-yielding varieties early in the field trials based on the plant phenotype a couple of months after sowing,” she said.

“This tool has the potential to accelerate crop breeding, allowing researchers to direct resources to the most promising varieties and deliver better adapted crops faster.”

The second project aims to develop a new weed detection model for Australian farmers.

“The focus is to locate and quantify weed density growing among similar looking crops, which will be used to guide weed management strategies that protect crop yield and reduce herbicide usage,” Ms Danilevicz said.

With climate change impacting crop production and threatening food security worldwide, Ms Danilevicz hopes her research will help breeders develop climate-resilient crops with higher yields.

“I believe the second project will benefit canola and lupin growers to reduce yield loss, as it is estimated that weeds cost \$3.3 billion annually to Australian grain growers,” she said.

“Herbicide researchers can also employ the weed detection model to quantify the effectiveness of the treatment in these species, which will be performed by one of our collaborators AHRI.”

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Online course upskills and empowers

The UWA Institute of Agriculture recently partnered with the University of Nairobi (UoN) to offer a four-week intensive Master Class in Performance Measurement using Data Envelopment Analysis (DEA).

Facilitated by Dr Amin Mugera, who is a co-leader of the Institute's Research Theme Agribusiness Ecosystems, the online course attracted 65 Master's and PhD students and four UoN faculty members from across nine African countries.

The course was hosted by UoN Professor John Mburu and funded by the Australia Africa University Network.

Dr Mugera said the economic growth of sub-Saharan countries largely depended on agriculture.



Successful students following an October award ceremony at the UoN Faculty of Agriculture. Photo: Professor John Mburu

“However, growth is hampered by low productivity in the agriculture sector and other sectors of the economy,” he said.

“The region's agricultural productivity growth continues to lag behind the rest of the world mainly due to low adoption and diffusion of available production technologies.”

The Master Class equipped trainees with knowledge and practical skills in mathematical programming in order to evaluate how well private or public agricultural enterprises were using available resources.

“From a public policy perspective, this is important in addressing the low productivity problem,” Dr Mugera said.

“The participants gained experience in efficiency analysis using DEA, which they can apply in their professional lives and future research projects.”

The Master Class will be offered by the UWA School of Agriculture and Environment in 2022 as an online 12-week [micro-credential course](#).

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National Rural Women's Award winner urges to 'disrupt for good'



Cara Peek and Hackett Professor Kadambot Siddique. Photos: Rosanna Candler

"You have two ears and one mouth for a reason. Listen, listen, listen ... that's all I can say when engaging with First Nations people."

The success of First Australians is the success of all Australians.

This was the powerful message of Cara Peek's public lecture *Disrupt for Good*, hosted by The UWA Institute of Agriculture in October.

Broome-based Ms Peek identifies as many things – a Yawuru/Bunuba woman, a successful lawyer, a diverse entrepreneurial leader and even a part-time "cowgirl".

Just one day after accepting the prestigious national AgriFutures 2020 Rural Women's Award, she told the audience at UWA that she was still feeling overwhelmed.

"Often, when you do this kind of work, you're so 'in' the work that you don't pay attention to whether other people are taking notice of what you do," she shared.

"When what you do is fuelled by who you are, that is purpose, and my purpose

is the advocacy and elevation of First Nations people."

As co-founder of The Cultural Intelligence Project, Ms Peek is currently launching an innovative First Nations entrepreneurs hub called *MakeltHappenHQ*.

"My job is to raise the cultural intelligence of this nation – or any person that I engage with – and in turn, raise my own when I'm engaging with other cultures," she said.

Ms Peek said the most important thing to do when engaging with First Nations people was to listen.

"Indigenous communities get a lot of people who come to them with solutions before they even know the problem," she said.

"It doesn't work, it never does. We need to strengthen the indigenous organisations' capacity and empower their leadership."

"You have two ears and one mouth for a reason. Listen, listen, listen ... that's all I can say when engaging with First Nations people."

Ms Peek spoke passionately about leading the annual female-run indigenous event *Rhythm+Ride Rodeo*.

"I am doing it for these smiling faces," she said while pointing to photos of the 'little champions' that compete in the *Saltwater Academy*.

"I had a seven-year-old rider come up to me and say: 'Thank you for doing this, we don't get stuff like this'."

"This might seem like a small way of tackling this issue. But if I have a kid that's willing to travel 12 hours to come to an event of mine, I know that they're going to listen to the positive role modelling that is there."

In closing, Ms Peek urged the crowd to think of how they could personally make a difference.

"Who can you identify to share just a piece of this knowledge?" she asked.

"Have that difficult conversation – whether it is about elevating or opening the door for indigenous voices, women's voices, or people from other diverse multicultural backgrounds."

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



Cara Peek delivering her lecture.

An open mind opens doors for UWA Associate Professor Blache

Being appointed UWA Associate Professor this year was the ideal excuse for Dominique Blache to reflect on an unpredictable research career spanning more than three decades.



Associate Professor Dominique Blache.
Photo: Rosanna Candler

Associate Professor Blache completed his PhD in his home country France and the UK, before moving across the world to accept a Postdoctoral Fellowship at UWA in 1993.

“My background is in pure physiology and neuroscience – whatever I learned about agriculture, I learned it here at UWA,” he shared.

“When I started my PhD in my twenties, if you had told me ‘You will work and research this area all your life’, I would have been so disappointed.

“The only thing I wouldn’t do in research is the same thing forever.”

“If you limit yourself to a topic, or a location, or the techniques that you use ... then you are not going to have a very interesting research life.”

When Associate Professor Blache began his fellowship at UWA, he was working on nutrition and reproduction in sheep with Emeritus Professor Graeme Martin.

Since then, he has worked across multiple areas with a menagerie of animals including alpaca, emu, duck and quail.

Although he has now returned to researching sheep (specifically in animal

welfare) Associate Professor Blache said every species he has studied has been fascinating.

“I’m going back to my origins and trying to find ways to measure what is happening in the brain of the animal, related to their welfare – such as biomarkers of positive mental states,” he said.

In addition to research and teaching commitments, Associate Professor Blache co-leads The UWA Institute of Agriculture research theme Sustainable Animal Production Systems and is the Graduate Research Coordinator at the UWA School of Agriculture and Environment.

When it comes to giving advice to students, he cautions them against taking the path of least resistance.

“If you limit yourself to a topic, or a location, or the techniques that you use ... then you are not going to have a very interesting research life,” he said.

“If a student asks me ‘What is the chance of getting a job?’ then I say, if you are open to any possibilities in the world, then you have a lot of chance.

“It’s a tough world. As long as you enjoy more than you struggle, it is a great world. The wonderful thing is that I know – when I wake up today or tomorrow – I will learn something new. That is what it is all about.”

Associate Professor Dominique Blache
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Estimating soil carbon at paddock scale

The opportunity to learn more about a UWA-developed tool that estimates soil carbon at a paddock scale was too good to pass up for the Agriculture and Food Minister Alannah MacTiernan.

In October, The Hon Ms MacTiernan and about 20 others attended the Wheatbelt Natural Resource Management’s SWARM Carbon Tool workshop in Wickiepin.

Dr Jolene Otway, who developed the tool as part of her PhD thesis with the UWA School

of Agriculture and Environment, delivered a detailed walkthrough of how SWARM estimated soil carbon levels without the need for soil testing.

Wheatbelt NRM Project Officer Bonny Dunlop-Heague said she was very impressed by Ms MacTiernan’s passion for carbon sequestration.

“It was inspiring to hear her talk about the subject in an agricultural context,” she said.

“She was also keen to meet local farmers and hear about the improvement practices being undertaken on their own farms.”

SWARM will soon be made publicly available for non-commercial use by farmers in the South West.

The project is led by Wheatbelt NRM in partnership with UWA, and is supported by the Wheatbelt Development Commission and Royalties for Regions.



A large group of SAgE staff and students attended the Open Day. Photos: Rosanna Candler

Exciting research on show at Staff Open Day

The UWA Shenton Park Field Station has served the agriculture industries of WA for more than 60 years and is home to dozens of active research projects.

Six of these innovative projects were showcased at the UWA School of Agriculture and Environment's (SAgE) Staff Open Day in October.

Head of SAgE Associate Professor James Fogarty said more than 75 UWA staff and students attended the half-day event.

"The fundamental industry-focused research that takes place at the UWA Shenton Park Field Station represents a central part of the School's activities," Professor Fogarty said.

The UWA Institute of Agriculture research theme co-leader Dr Andrew Guzzomi gave visitors a tour of the new Centre for Engineering Innovation: Agriculture and Ecological Restoration.

Dr Guzzomi expanded on the CEIAER's research achievements, prototyping equipment, agricultural machinery and patented inventions.

More than 5ha of irrigated plot land at UWA Shenton Park Field Station gives researchers the unique 'real world' opportunity to grow multiple large-scale trials at one time.

UWA Associate Professor Phillip Nichols and Senior Research Officer Brad Wintle presented on the latest Annual Legume

Breeding project activities with partner PGG Wrightson Seeds, including conducting field trials of subterranean clover to be selectively bred for different rainfall zones.

In a nearby field, Australian Herbicide Resistance Initiative Research Fellow Dr Roberto Busi demonstrated the first-year findings from his GRDC-funded national project to provide effective weed management strategies to mitigate new herbicide resistance issues in annual ryegrass.

Future Green Solutions (FGS) Managing Director Luke Wheat helped visitors get up close and personal with black soldier fly larvae as part of the collaborative UWA project to transform agricultural wastes into valuable commodities.



Associate Professor Phillip Nichols and Senior Research Officer Brad Wintle.



Dr Andrew Guzzomi and research colleagues at the CEIAER.

In a prototype facility for large-scale heat tolerance screening, The UWA Institute of Agriculture Research Fellow Dr Sheng Chen shared updates from his five-year GRDC-funded national canola heat tolerance project.

At the Aquaculture Laboratory, UWA PhD candidate Isobel Sewell described her project with FGS to investigate the suitability of black soldier fly larvae in marron and barramundi aquaculture diets.

For more information, visit the [Shenton Park Field Station](https://www.shentonparkfieldstation.com.au) website.

"The fundamental industry-focused research that takes place at the UWA Shenton Park Field Station represents a central part of the School's activities."

Sustainability focus at speed seminar



CSIRO and UWA researchers at the second joint meeting.

Exploring research into sustainable animal production and grazing systems was on the agenda for the second joint UWA and CSIRO speed seminar held in September.

A group of enthusiastic researchers gathered at the Indian Ocean Marine Research Centre on Crawley campus to explore latest research projects, discuss common interests and encourage future collaboration.

Dr Hayley Norman from CSIRO, who recently joined The UWA Institute of Agriculture's Industry Advisory Board, presented on farming systems approaches to managing reproducing sheep during climatic extremes, followed by UWA Associate Professor Dominique Blache on impacts of heat stress and oestrogenic subclover on sheep reproduction.

Dr Norman and Associate Professor Blache are part of a new research team

(supported by MLA, with Murdoch University and NSW DPI) exploring the impact of climate on reproduction.

Jointly covering pastures and fodder were CSIRO scientists Dr Dean Thomas and Robert Harrison – who expanded on their research into opportunities from new annual pasture legumes focusing on the Dryland Legume Pasture Systems project.

UWA Professor Megan Ryan then provided an update on the Annual Legume Breeding Australia project.

CSIRO Senior Experimental Scientist Dr Yvette Oliver covered soil science, water use efficiency and understanding plant available water capacity for farming systems decisions, and UWA Assistant Professor Matthias Leopold and Professor Nanthi Bolan rounded out the seminar with their talk on proximal sensing of soil water and valorisation of food wastes.

Following the presentations, researchers enjoyed finger food and fruitful discussions.

Scholarship pushes boundaries to achieve impossible

Research aspirations that seemed impossible when she first arrived at UWA four years ago are now counted as Tamsal Murtza's proudest achievements.

Ms Murtza was among 20 outstanding students from The University of Agriculture Faisalabad (UAF) to receive a UWA-UAF joint scholarship (initiated by The UWA Institute of Agriculture) to complete their PhD studies at UWA since 2008.

The scholarship program is part of the long-standing collaboration and Memorandum of Understanding between the two universities.

The Institute is currently working with UAF on another round of joint PhD scholarships to commence in 2022.

Ms Murtza recently completed her PhD on the geographic and temporal patterns of a rapidly evolving plant pathogen causing white leaf spot disease.

PhD supervisor UWA Professor Martin Barbetti said she was one of the hardest working and finest students he had ever had.

"Tamsal was always keen to learn and capture every opportunity," Professor Barbetti said.

"That she was so considerate of others and happy to help and to pass on her skills made her a great team member who will be sorely missed by all."

When she flew home to Pakistan earlier this month, Ms Murtza took the opportunity to reflect on her time at UWA.

"This work setting helped me push my boundaries that seemed nearly impossible at the start of my PhD journey," she said.

"Throughout the course of my PhD, I was immensely inspired by an impressive cohort of critical and intriguing minds doing excellent research.



"Engaging with unfamiliar cultures, perspectives and ideas created conditions for meaningful growth."

Ms Murtza said she felt very fortunate to have shared her research with the global scientific community.

"I published my research findings in internationally-recognised journals and also presented my research at different prestigious forums," she said.

"I am now looking forward to re-join my parent university UAF as a faculty member."

Tamsal Murtza
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Navigating net zero for WA agriculture

The UWA Institute of Agriculture partnered with AgZero2030 for a recent event to help drive the conversation around a carbon neutral future for WA agriculture.

More than 100 research, industry, and supply chain representatives gathered at The University Club of WA in October to collaboratively explore how to best navigate the net zero transition.

AgZero2030 is a group of WA farmers, primary industries professionals and organisations who have formed a movement to promote positive responses to climate change.

The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique delivered the welcome address, followed by presentations from leading industry stakeholders on stage and online.

The event culminated in an interactive workshop to discuss the challenges and opportunities of a net zero economy.

Gabriel Crane from Integrity Ag Services established the scope of greenhouse gas emissions and the growing reality of a carbon neutral agricultural supply chain.

Savoir Consulting Director Larissa Taylor delivered a powerful message.

“Western Australian food and agriculture sectors have an extraordinary opportunity

to build Indian Ocean timezone premium agri-food value chains that are climate-resilient, trade-competitive, low-carbon, high natural capital and high-trust,” Ms Taylor said.

“The public, our customers and investors want this ... so we’re co-designing our playbook together.”

The United Nation’s Sustainable Development Goals were a recurring theme, especially through forward-thinking examples set by Liam Moltoni from Boortmalt regarding opportunities for low emissions barley supply chains.

Kondinin Group Research Manager Ben White communicated the adoption of on

farm carbon calculators and emerging low emission technologies in the context of a carbon contribution breakdown for the sector.

Fiona Meaton from Price Waterhouse Coopers wrapped up the presentations with legal considerations, risks, and the ‘push and pull’ factors driving the evolving carbon market.

Momentum was generated towards continuing the conversation in the form of an annual forum and cross-industry strategy development.

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Hackett Professor Kadambot Siddique, Fiona Meaton, AgZero2030 chairman Simon Wallwork, Larissa Taylor and Ben White. Photo: Rosanna Candler

Study forecasts the impact of banning pesticides

UWA Master’s student Alison Walsh has found that a ban on two common pesticides in Australia would increase cropping costs and decrease farm profit.

In a study recently published in the journal *Agricultural Systems* co-authored by Professor Ross Kingwell, Ms Walsh explored the impact on farm business and farming systems is the use of glyphosate and paraquat were banned in the Central Wheatbelt region of WA.

Due to the growing public perception that they are a threat to human health, governments around the world have already banned these herbicides.

Using the bioeconomic farm model MIDAS, Ms Walsh estimated the likely impacts on farming systems if such a ban were to occur in Australia.

Ms Walsh found it would cause “sizeable declines in farm profit” due to increased cropping costs, and in turn increase grain prices.

“Despite several tactics and investments that farmers might employ to combat the loss of these herbicides, none would prevent a reduction in farm profit,” she said.

“The likelihood of such large declines in profit should spur the invention and development of cost-effective means of weed control.”

“The likelihood of such large declines in profit should spur the invention and development of cost-effective means of weed control.”

The study predicted that farming systems would move away from cropping towards sheep production – in turn increasing greenhouse gas emissions.

However, if there was a global ban on glyphosate and paraquat, then Australian farm businesses would be advantaged as they rely less on glyphosate-tolerant crops.

Alison Walsh
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Bug's eye view identifies aphids in wheat crops

Are drones the ultimate rapid scouting method to detect aphid-induced stress in wheat crops?

UWA researchers Associate Professor Ken Flower, Associate Professor Nik Callow, Master's student Caroline Chua and DPIRD's Dr Dustin Severtson and Amber Balfour-Cunningham are investigating this very question.



Dr Severtson said the current methods to scout grain crops for pests and diseases were time-consuming and often inaccurate.

"Random sampling hopes to find pest hotspots in parts of paddocks, but often miss them," he said.

"This means growers are either losing money on unnecessary pesticide application or yield loss in parts of crops which are missed."

Spatial data, such as remote sensing using near-infrared and infrared spectra, can effectively detect and map regions of crops that are experiencing biotic or abiotic stress.

Prior research has shown the potential for using reflectance indices to identify stressed areas of canola crops impacted by biotic (e.g. aphid) and abiotic (e.g. potassium deficiency) factors.

Associate Professor Flower said the specific objective of the project was to determine which reflected wavelengths were changed after infesting wheat plants with aphids, and if these could be detected using drone-based multispectral

sensors.

A field trial was seeded at DPIRD in Northam and plots were infested with different levels of aphid.

A multispectral drone was used to image the plots along with ground-based aphid counts and leaf chlorophyll (SPAD) measurements.

Unfortunately, heavy rains in the main growing season prevented large numbers of aphids accumulating in the plots – and the early data sets were yet to be assessed for any aphid-induced crop differences.

As a result, a separate pot experiment was established at the UWA Plant Growth Facility, where wheat plants were grown and then infested with different levels of aphid.

The pots were kept in a 'bug-dorm' to prevent the aphids spreading within the glasshouse.

The control and infested plants/leaves were imaged on several occasions with a multispectral camera and spectroradiometer to assess reflectance data under more controlled conditions.

The project is expected to be completed in early 2022.

Associate Professor Ken Flower
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Virtual Village giving ageism the boot

Research activities at UWA Farm Ridgfield are not the only way the university is actively engaged with the community.

The Federal Government Senior's Connected Program recently awarded the UWA Social Care and Ageing (SAGE) Living Lab and collaborators a \$377,750 grant to jointly establish a Virtual Village across Wandering, Wickiepin, Cuballing, and Pingelly.

The Virtual Village is part of an alternative ageing in place model called Staying in Place.

With no fences, walls or special buildings – the digital village is designed to support older people to support one another and maintain a healthy body, active mind and community connection.

SAGE has partnered with the Pingelly Somerset Alliance to research, validate and report on the establishment and operation of the virtual village so it can roll out to other small, isolated, rural communities.

Over the past 18 months, they have built awareness about the Virtual Village through an anti-ageism campaign called Giving Ageism the Boot in Pingelly.

SAGE Director Professor Loretta Baldassar said it had been a wonderful experience to see such an exciting project grow and develop.

"In order for the innovation in farming coming out of Ridgfield to be successful, we also need to support the local people, paying attention to their social and community needs in a holistic way," Professor Baldassar said.

"This way the farm is more fully integrated into the region, rather than just a separate university research endeavour."

Professor Loretta Baldassar
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UWA Professor Loretta Baldassar, Dr Silvia Lozeva, Dr Catriona Stevens, Mrs Lee Steele, The Hon Helen Morton and Dr Lukasz Krzyzowski.

Native fungus could be key

Could a recently-discovered Australian native fungus be the key to minimising the financial and environmental burdens of synthetic phosphorus fertilisers?

Dr Khalil Kariman at the UWA School of Agriculture and Environment has partnered with UWA Professor Zed Rengel and DPIRD's Dr Craig Scanlan are keen to find out.

Dr Kariman discovered a novel plant-fungus symbiosis between a native fungus *Austroboletus occidentalis* and the native jarrah (*Eucalyptus marginata*) during his PhD studies almost a decade ago.

A few years later, he and Professor Rengel together established the fungus' "extraordinary potential" as a novel biofertiliser.

As part of a GRDC-funded project, the research team are now investigating how to exploit this novel biofertiliser for agricultural crops.



Dr Khalil Kariman with a colony of the native fungus. Photo: Rosanna Candler

Dr Kariman said their studies have shown that the native fungus can boost the phosphorus nutrition of crops such as wheat, barley and even canola in both controlled environment and field conditions.

"This native fungus has the remarkable potential to boost plant growth and nutrition and induce stress tolerance (for example, against drought) in host plants," he said.

"This is presumably linked to evolution of the fungus in the nutrient poor and harsh jarrah forest ecosystem of south-west of WA.

"The fungus needed to be resilient to a variety of soil constraints such as nutrient deficiency (phosphorus, in particular), high metal contents and pH extremes, as well as environmental stresses like drought and heat."

Dr Kariman said the research could help minimise the use of synthetic phosphorus fertilisers in agroecosystems.

"A major percentage of applied phosphorus fertilisers can be immobilised in soil due to adsorption by soil particles and organic matter, or chemical fixation through binding with metals," he said.

"This leads to an ongoing accumulation of residual phosphorus in crop fields, which is mostly inaccessible to plant roots. It is crucial to find an environmentally-friendly solution to tap into this huge residual phosphorus bank in field soils."

Dr Khalil Kariman
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Satellite remote sensing exposes impacts of climate change

Internationally-renowned remote sensing expert Dr Richard Smith credits his postgraduate studies at UWA in the 1970s as first sparking his interest in the environment.

"While working as a farm economist for farmers managing over a million acres, the environment was an externality, only profit mattered," Dr Smith said.

"As the impacts of salinity, erosion and loss of biodiversity was everywhere evident, a PhD at UWA enabled me to switch my focus.

"Subsequently, the technology of multi-spectral remote sensing from Earth Observing (EO) Satellites became available for measuring environmental impacts at continental scale for the improved management of the vegetation of the vast state of WA."

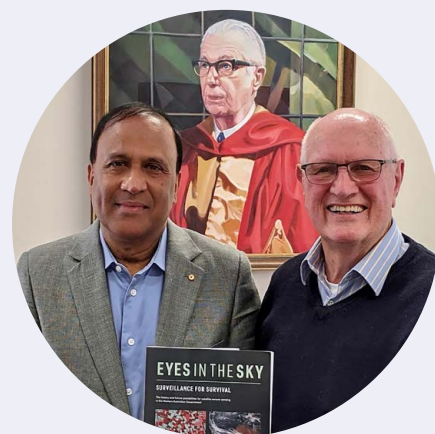
Dr Smith recently attended The UWA Institute of Agriculture's September morning tea to present his new book *Eyes in the Sky: Surveillance for Survival*.

Dr Smith said that EO applications increasingly revealed the impacts of climate change.

"One example is the systematic mapping of burnt area from Australian wildfires over the last 32 years, which revealed an increase on average of 1 million ha per year," he said.

"As a result, management of the burning of Australian tropical savannas has been radically modified to reverse these impacts while reducing greenhouse emissions."

Although he has worked around the world, including at NASA's Goddard Space Flight Centre in the USA, Dr Smith's attention is now set firmly on his home state WA.



Hackett Professor Kadambot Siddique and Dr Richard Smith at the morning tea.

"To improve the application of EO science and technology, the WA Government should implement an Earth Observatory (WAVE-O) similar to NASA's," he said.

Dr Richard Smith
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Richgro tour impresses with sustainable innovation

There was no substitute to seeing Richgro's Anaerobic Digestion (AD) plant up close and personal during a special visit to the Jandakot facility for select UWA staff and students in October.

"We are looking to increase our research output by partnering with UWA for a greater focus on soil health, and plant productivity using sustainable fertilisers."

Managing Director Tim Richards and his father, chairman Geoff Richards, led the tour of the multimillion-dollar

plant – which is the first of its kind in the Southern Hemisphere.

The tour group included UWA Deputy Vice-Chancellor (Research) Professor Tim Colmer, The UWA Institute of Agriculture Director Hackett Professor Kadambot Siddique, soil scientist Professor Nanthi Bolan, UWA Research Fellow and Richgro Research and Development Manager Dr Bede Mickan, and students George Mercer, Cassandra Howell, Minnie Meng and Communications Officer Rosanna Candler.

The group discussed potential opportunities for collaboration between UWA and Richgro on projects of mutual interest.

Dr Mickan said Richgro was heavily invested in research with UWA and saw real value in utilising existing research infrastructure.

"We are looking to increase our research output by partnering with UWA for a greater focus on soil health, and plant productivity

using sustainable fertilisers," he said.

UWA Botany honours student Ms Howell said she was struck by Richgro's investment in and commitment to research.

"As a student interested in real-world applications for research, it was really exciting to meet an industry partner that both supports research and uses research to develop their products," she said.

"Talking to Geoff and Tim, it was clear that they were very forward thinking and embracing sustainable innovation at every opportunity.

"It is nice to see that that a company can create high-quality products while caring about the environment at the same time."

Dr Bede Mickan
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Prolific soil scientist remembered for generous spirit

Mike Bolland was a dedicated agricultural scientist, prolific author, dear friend and respected collaborator to many at UWA.

Over the years, Dr Bolland worked closely with former UWA Vice Chancellor Emeritus Professor Alan Robson, Hackett Professor Kadambot Siddique, Professor Zed Rengel, Emeritus Professor Hans Lambers and many more.

"Mike was a remarkable scientist and wonderful human being," Professor Siddique said.

"His field-based research, especially on phosphorous nutrition in crops and pastures, made a significant impact on WA agriculture."

Born in Nairobi on 20 June 1946, Dr Bolland moved to Perth with his family when he was 19.

Dr Bolland completed his cadetship at the WA Department of Agriculture (now DPIRD) with a first-class honours degree in 1970 and PhD at UWA in soil chemistry in 1975 before postings to the Department's offices in Perth, Katanning, Esperance and Bunbury.

Dr Bolland enjoyed an international reputation and was highly respected and liked by his professional and industry peers.

"Mike was a wonderful eccentric and sometimes a larrikin," friend and former DPIRD colleague Martin Staines said.

"He was a gentle and genuine man and modest to a fault, as he rarely spoke of his achievements as a scientist."

Although he retired in 2010, Dr Bolland continued to publish, submitting an article as co-author only weeks before his death.

Dr Bolland's other passion was his beloved family.



He is survived by his wife Dale, three children Sarah, Simon and Sam, four grandchildren Isabelle, Shaylee, Seb and Cecilia and his great grandson Fergus.

As a keen cyclist, Dr Bolland rode a couple of hours every day without fail for many years.

On 2 October, he passed away in the saddle – cycling to the very end.

Vale Dr Mike "Spike" Bolland.



UWA staff and students with Richgro leaders during the tour. Photo: Rosanna Candler

AWARDS AND INDUSTRY RECOGNITION

NAME	AWARD
Dr Joanna Melonek	WA Young Tall Poppy Science Award
Dr Joanna Melonek	2021 Peter Goldacre Award
UWA Farm Ridgefield	RSPCA WA Agriculture Award
Prof Kadambot Siddique	The Australian's 2021 Research Magazine 'Top Researcher'
A/Prof Ram Pandit	The Australian's 2021 Research Magazine 'Top Researcher'
Prof Kadambot Siddique	2021 Clarivate Highly Cited Researcher (Agricultural Sciences and Plant & Animal Science)
E/Prof Hans Lambers	2021 Clarivate Highly Cited Researcher (Agricultural Sciences and Plant & Animal Science)
Prof Nanthi Bolan	2021 Clarivate Highly Cited Researcher (Environment & Ecology)
Prof David Edwards	2021 Clarivate Highly Cited Researcher (Cross-Field)
Adj/Prof Muhammad Farooq	2021 Clarivate Highly Cited Researcher (Agricultural Sciences)
Manish Sharma	AW Howard Tim Healey Scholarship
Julian van der Zanden	AW Howard Tim Healey Scholarship
E/Prof Graeme Martin	Fellow and Life Member of the Society for Reproductive Biology

NEW IOA APPOINTMENTS

NAME	START DATE
Senior Honorary Research Fellow Jim Fortune	14 July 2021
Adj A/Prof Nitin Mantri	14 July 2021
Adj Lecturer Aanandini Ganesalingam	6 September 2021
Adj A/Prof Chellapilla Bharadwaj	27 October 2021
Adj A/Prof Rachel Standish	27 October 2021
Adj Prof Ajit K Sarmah	8 November 2021

VISITORS TO IOA			
NAME OF VISITOR	VISITOR'S ORGANISATION AND COUNTRY	HOST DETAILS	DATE OF VISIT
Dr Richard Smith	Perth WA	The UWA Institute of Agriculture	29 September
Kirsten Rose	Future Industries CSIRO, WA	UWA DVCR	12 October
Andrew Dover	Shire of Pingelly, WA	The UWA Institute of Agriculture	18 October
Cara Peek	Saltwater Country Ltd, Broome WA	The UWA Institute of Agriculture	21 October
Dylan Walsh	DFAT, WA	The UWA Institute of Agriculture	25 October

NEW POSTGRADUATE RESEARCH STUDENTS (PhD)				
STUDENT NAME	TOPIC	SCHOOL	SUPERVISORS	FUNDING BODY
Nathaniel Scott Anderson	The effects of ecosystem moisture on fire regimes in the Tingle mosaic	UWA School of Agriculture and Environment	A/Prof Nik Callow, Dr Ryan Tangney, Dr Joe Fontaine, Dr Ben Miller & Dr Alison Miller	RTP, and Destination Australia Scholarship
Rex Cao	Improving herbicide efficacy on Australian farms through strategic mixes and use patterns	UWA School of Agriculture and Environment	Dr Roberto Busi, Dr Danica Goggin & Mark Slatter	RTP, supervisors and UWA Graduate Research School

RESEARCH GRANTS				
TITLE	FUNDING PERIOD	FUNDING BODY	SUPERVISORS	
Protecting Ethiopian lentil crops	2021-2026	Australian Centre for International Agricultural Research (ACIAR)	Prof Martin Barbetti, Dr Mingpei You & Adj/Prof Roger Jones	
A proof of concept for technology enabled intensive marron farming	2021-2023	AgriFutures Australia	Dr Matthew Fraser, Prof Martin Barbetti, Prof Phillip Vercoe, Dr Andrew Guzzomi, Dr Leah Beesley, J Middleton & Dr Craig Lawrence	
Developing commercial practices for Asparagopsis seaweed cultivation at scale: an opportunity for rapid industry growth and optimising social and environmental outcomes	2021-2023	Cooperative Research Centre (CRC) Program	Dr John Statton, Prof Gary Kendrick & Prof Phillip Vercoe	
Developing the story of WA honey: Focus on Japan	2021-2022	CRC for Honey Bee Products	Dr Daniel Schepis, Dr Liudmila Tarabashkina & Prof Sharon Purchase	
Investigating heat stress in ewes – reproductive performance	2021-2025	Meat & Livestock Australia	Prof Shane Maloney, Dr Kelsey Pool, Dr Dominique Blache, Prof Diana Walker & Dr Shannon Algar	
How can we engage rural youth of Timor-Leste in farming	2021-2022	ACIAR	Prof William Erskine & Rob Williams	
Impact of COVID-19 on vegetable producers: The case of cauliflower and broccoli farmers in the municipality of Aileu, Timor-Leste	2021-2022	ACIAR	A/Prof Fay Rola-Rubzen & Paulo Correia	
Laying the foundations for the Australian Critical Zone Observatories	2021-2023	AuScope Ltd	A/Prof Matthias Leopold, A/Prof Sally Thompson & Prof Jason Beringer	
Pastoral partners Accelerating the transition	2021-2024	Gascoyne Catchment Group Inc.	Prof Phillip Vercoe	
Assessing adoption and diffusion of agricultural innovations in Bangladesh	2021-2023	Krishi Gobeshona Foundation	Prof Nazrul Islam (North South University, Bangladesh), Hackett Prof Kadambot Siddique, Dr Amin Mugeru (UWA), Curtin University & Bangladesh Agricultural University	
Design, establishment and benefits of edible shelter to improve lamb survival and whole-farm profitability	2021-2025	Meat & Livestock Australia	A/Prof Dominique Blache, Prof Shane Maloney, Dr Diana Walker & Dr Amin Mugeru	
Operating funds for a PhD research project at The University of Western Australia to accelerate genetic gain in field peas based on genomic and optimal contributions selection	2021-2024	Norddeutsche Pflanzenzucht Hans-Georg Lembke KG	Prof Wallace Cowling & Felipe Castro Urrea	
Insecticide resistance in the green peach aphid: National surveillance, preparedness and implications for virus management	2021-2024	CSIRO	A/Prof Parwinder Kaur	

UWA IOA 2021 Publications (August-December)

Peer Reviewed Journals

- Ahmed WA, Xia Y, Li R, Zhang H, Siddique KHM and Guo P (2021). Identification and Analysis of Small Interfering RNAs Associated with Heat Stress in Flowering Chinese Cabbage Using High-Throughput Sequencing. *Frontiers in Genetics* **12** doi: 10.3389/fgene.2021.746816
- Albornoz FE, Ryan MH, Bending GD, Hilton S, Dickie IA, Gleeson DB and Standish RJ (2021). Agricultural land-use favours Mucromycotinian, but not Glomeromycotinian, arbuscular mycorrhizal fungi across ten biomes. *New Phytologist* doi: 10.1111/nph.17780
- Arruda B, George P, Robin A, Mescolotti DLC, Herrera H, Jones DL and Andreote FD (2021). Manipulation of the soil microbiome regulates the colonization of plants by arbuscular mycorrhizal fungi. *Mycorrhiza* **31** doi: 10.1007/s00572-021-01044-3
- Aziz NF, Chamhuri N and Batt PJ (2021). Barriers and Benefits Arising from the Adoption of Sustainable Certification for Smallholder Oil Palm Producers in Malaysia: A Systematic Review of Literature. *Sustainability* **13**(18) doi: 10.3390/su131810009
- Bayer P, Scheben A, Golicz A, Yuan Y, Faure S, Lee HT, Chawla H, Anderson R, Bancroft I, Raman H, Lim YP, Robbins S, Jiang L, Liu S, Barker M, Schranz E, Wang X, King G, Pires JC, Chalhoub B, Snowdon R, Batley J and Edwards D (2021). Modelling of gene loss propensity in the pangenomes of three Brassica species suggests different mechanisms between polyploids and diploids. *Plant Biotechnology Journal* doi: 10.1111/pbi.13674
- Bayer PE, Petereit J, Danilevicz MF, Anderson R, Batley J and Edwards D (2021). The application of pangenomics and machine learning in genomic selection. *Plant Genome* doi: 10.1002/tpg2.20112
- Bayer PE, Valliyodan B, Hu H, Marsh J, Yuan Y, Vuong TD, Patil G, Song Q, Batley J, Varshney RK, Lam HM, Edwards D and Nguyen HY (2021). Sequencing the USDA core soybean collection reveals gene loss during domestication and breeding. *Plant Genome* doi: 10.1002/tpg2.20109
- Becquer A, Haling RE, Warren A, Alden Hull R, Stefanski A, Richardson AE, Ryan MH, Kidd DR, Lambers H, Sandral GA and Simpson RJ. Critical phosphorus requirements of Trifolium species: The importance of root morphology and root acclimation in response to phosphorus stress. *Physiologia Plantarum* **173** doi: 10.1111/pp1.13500
- Beena R, Kirubakaran S, Nithya N, Manickavelu A, Sah RP, Abida PS, Sreekumar J, Jaslam PM, Rejeth R, Jayalekshmy VG, Roy S, Manju RV, Viji MM and Siddique KHM (2021). Association mapping of drought tolerance and agronomic traits in rice (*Oryza sativa* L.) landraces. *BMC Plant Biology* **23** doi: 10.1186/s12870-021-03272-3
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UPCOMING EVENTS

GRDC Grains Research Update

Monday 21 and Tuesday 22
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UWA Open Day

Sunday 27 March, 2022

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