Kia ora MSSANZers,

Happy almost-Friday! There is a provincial holiday here tomorrow, so the digest is a little earlier than usual. Despite the earliness there is a bumper crop of notices for your interest, including: a few notifications about journals and conferences; several job/studentship announcements; a couple of Special Issue alerts; two symposiums; …

Ngā mihi, Val

- From Serena Hamilton, the inaugural issue of SESMO has now been published and the second is underway. See leaflet attached which outlines the aims and scope of SESMO and lists papers published to date. Thank you to the authors, reviewers, editors as well as our supporters (which includes MSSANZ!) who have made this possible. We invite you to submit your work to the journal for consideration. We are also canvassing topics for special issues. If you would like to suggest a topic and assist as a Guest Editor please let us know.
- There are two Special Issues for *Agricultural Systems* that will soon open to submissions that will be of interest to some members of MSSANZ. The first SI is concerned with sustainability transitions and the second with advances in farm system models and modelling. See two attachments describing these calls.
- Alexey Voinov has five PhD studentships available (first closing date is 15 December). Three of the positions are open topic studentships and the other two are targeted with titles of "Disasters and urbanisation" and "Housing bubbles and economic expectations". The positions are at UTS within the PERSWADE Centre, come with a stipend plus fee waiver and are open to all nationalities. A document describing these positions and how to apply is attached.
- The APSIM Initiative is running a one-day Symposium followed by two days of advanced training workshops. These will be held in 25-27 March 2020 in Brisbane. Please see below a call for presentation submissions for the Symposium below as well as information about how to register for the Symposium and Workshops.
- Tenure track Asst. Professor Soil Hydrology / Pedology / Water Physics at Texas A&M University, first assessment of applications on 15 January 2020. See the full description and how to apply attached.
- The 2nd international Symposium on Water Systems Operations that will take place in Bristol, United Kingdom, 2-4 September 2020. The full list of the Symposium themes and keywords, practical information, and updates are available at: http://iswso2020.info. Two-page abstracts can be submitted fro 3 February to 26 April. The symposium will have a mix of oral and poster presentations and dedicated time for brainstorming collaboration ideas and project proposals and will welcome contributions presenting new methods for data analysis, modelling and optimisation of water resource systems, as well as case study applications, examples of co-production of research between researchers and practitioners, and tools for enhancing the transparency, reproducibility and communication of analyses.
- Also attached, a post-doctoral position at La Trobe University and CSIRO located in Toowoomba with the work centred on improving the modelling of mungbean. The closing date is 1 December 2019.

Please consider attending the upcoming APSIM Symposium and/or Workshops in March 2020. For more information: https://www.apsim.info/support/apsim-symposium-and-advanced-training-workshops/ Please note the new cut-off date of 23 February 2020 for registration.

Paper submission for the 1 day Symposium has two deadline dates – those submitted by 15 December 2019 will have first priority for speaking slots, those submitted by the final date of 15 January 2020 will be allocated to speaker or poster slots depending on availability. All submissions will be assessed for fit with the session theme and relevance to the audience and will be lightly reviewed (i.e.. for clarity and language). The 2-page template can be downloaded from - https://www.apsim.info/support/apsim-symposium-and-advanced-training-workshops/apsim-symposium/ Presentation slot will be approx. 15 min in length, which should include time for one or two Q&As.

There are eight, half-day workshops on offer – details can be found at
- https://www.apsim.info/support/apsim-symposium-and-advanced-training-workshops/apsim-advanced-workshops/

To register, please email apsim@csiro.au to be forwarded the online registration form.

Any questions or queries, please email apsim@csiro.au.

Socio-Environmental Systems Modelling

An Open Access, Community Driven, Scholarly Journal

SESMO Aims

To progress our understanding, learning and decision making on major socio-environmental issues using advances in model-grounded processes that engage with institutional and governance contexts, cross-sectoral and scale challenges, and stakeholder perspectives.

Innovations in **thinking** and **practice** to support resolution of grand challenge problems, including generating **policy insights** and evidence, and reducing and managing critical **uncertainties**

***SESMO** seeks papers related to:*

- ***Frameworks, methodologies**, or **case studies** for workable solutions to socio-environmental challenges*
- *Methods to understand and track **uncertainties***
- ***Engaging users** and **decision makers** to influence technical efforts*
- ***Decision-support systems, model coupling** and **integration** techniques, **web interfaces, big data** analysis, **optimization, stakeholder engagement** methods, **visioning** techniques, the use of **narrative** and **visualization** techniques*

Volume 1

Migration, Intensification, and Diversification as Adaptive Strategies

Andrew Reid Bell, Carlos Calvo-Hernandez, Michael Oppenheimer

Conceptual modeling for improved understanding of the Rio Grande/Río Bravo socio-environmental system

Jennifer Koch, Jack R Friedman, Stephanie Paladino, Sophie Plassin, Kyndra Spencer

Spatially-explicit simulation of two-way coupling of complex socio-environmental systems: Socio-hydrological risk and decision making in Mexico City

Luis A. Bojórquez-Tapia, Marco Janssen, Hallie Eakin, Andres Baeza, Fidel Serrano-Candela, Paola Gómez-Priego, Yosune Miquelajauregui

What are the merits of endogenising land-use change dynamics into model-based climate adaptation planning?

Bramka Arga Jafino, Marjolijn Haasnoot, Jan H Kwakkel

An in-silico analysis of information sharing systems for adaptable resources management: a case study of oyster farmers

Nicolas Paget, Bruno Bonté, Olivier Barreteau, Gabriella Pigozzi, Pierre Maurel

A retrospective assessment of marine biodiversity: a critical analysis of integration and aggregation rules

Susanna Jernberg, Henrik Nygård, Ainars Aunins, Antti Lappalainen, Anna-Stiina Heiskanen, Jens Olsson, Pirkko Kauppila, Samuli Korpinen, Kirsi Kostamo, Laura Uusitalo

Where should livestock graze? Integrated modeling and optimization to guide grazing management in the Cañete basin, Peru

Perrine Hamel, Genowefa Blundo-Canto, Virginia Kowal, Benjamin P. Bryant, Peter L. Hawthorne, Rebecca Chaplin-Kramer

Volume 2 (in progress)

Eight grand challenges in socio-environmental systems modeling

Sondoss Elsawah, Tatiana Filatova, Anthony J. Jakeman, Albert J. Kettner, Moira L. Zellner, Ioannis N. Athanasiadis, Serena H. Hamilton, Robert L. Axtell, Daniel G. Brown, Jonathan M. Gilligan, Marco A. Janssen, Derek T. Robinson, Julie Rozenberg, Isaac I. T. Ullah, Steve J. Lade

Contrasting stakeholder and scientist conceptual models of food-energy-water systems: a case study in Magic Valley, Southern Idaho

Grace B. Villamor, David L. Griffith, Andrew Kliskey, Lilian Alessa

www.sesmo.org

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ISSN 2663-3027

Call for Submissions for a Special Issue in Agricultural Systems:

Sustainability transitions in the making in agro-ecosystems: changes in scope and methods in agronomy

Description of the Special Issue:

Rethinking food production and consumption for a future with a changed climate, a vastly limited availability of fossil fuels and a larger world population than today is one of the great challenges of our times. The required long-term, multi-dimensional & fundamental transformation of large socio-technical systems towards more sustainable modes of production and consumption are denoted as 'sustainability transitions' by sustainability scientists (e.g. Markard et al., 2012). Such developments play out over decades or more, so that what research can contribute to today have been called 'transitions in the making' (Elzen et al., 2011).

The increasing urgency of redesigning the way food is produced and used has important implications for the systems perspective in agronomy. Roughly, the last decade of the previous century witnessed a change in scope from field to farm scale, followed by a parallel change from field to continental and global scales in the first decade of this century. Over the past 10 years, attention for a food system perspective has grown, geographically limited to territories and regions, or comprising the globe. These changes in scope were triggered by well-argued calls for more attention for agricultural outputs beyond food, feed and fibre, and for turning the agricultural sector from one that causes overstepping of global environmental and social boundaries to one that supports a safe operating space (Raworth, 2017; Rockstrom et al., 2009).

Another change during the past decade has been an increased attention for the 'how-to' question associated with redesign of current agricultural systems (e.g. Duru et al., 2015; Fazey et al., 2018). The how-to question challenges the role and organization of research, where training and reward systems are still dominated by analytical stands – addressing 'what' and 'why' questions - rather than by integrated approaches appropriate for supporting sustainability transitions in social-ecological systems.

Stimulated by two recent conferences, the 6th Farming Systems Design (FSD6) conference in August 2019 in Montevideo and the European Conference on Crop Diversification (ECCD) in September 2019 in Budapest, and building on special issues in this journal (Berthet et al., 2018) and in the European Journal of Agronomy (Reidsma and Jeuffroy, 2017) on farming systems analysis and design for innovation ***we here propose a special issue dedicated to bringing out the state of the art on agricultural systems research for sustainability transitions***.

We invite contributions that deal with sustainability transitions in the making at the level of farming systems, value chains and food systems. We are looking for experiences and theoretical reflections on how agronomists, together with other scientists and societal actors have organized themselves to bring about changes towards greater systems sustainability. Manuscripts should address both the material changes obtained as well as the process that allowed the scientific contribution to societal change. Manuscripts that exclusively address scenario studies, role-plays or other interventions that are not part of a larger strategy for change are not sought after. We encourage contributions involving accounts 'half-way'

through projects that describe strategies, material changes and process, as a basis to accelerate learning in the systems science community.

Manuscript submission:

- Submission of manuscripts opens: 1st December 2019
- First submission of manuscripts closes: 30th April 2020
- Manuscripts will be published online as they are accepted following the usual review procedures
- Final publication of the Special Issue: November 2020

All submissions are *via* Elsevier's Agricultural Systems website – follow the "Submit your article". All submissions will go through the standard review and editorial processes for Agricultural Systems and must fit within the scope of the journal as well as the aim of this Special Issue.

As early as practicable, authors should submit a short description of their planned manuscript for advice from the SI Guest Editors regarding fit with the SI and journal scope.

Guest Editors:

Walter Rossing, Associate Professor at Wageningen University, the Netherlands. Member editorial boards of AGSY and EJA. ResearchGate page

Santiago Dogliotti, Professor at Faculty of Agronomy, University of the Republic, Uruguay. Former Editor of Agricultural Systems. ResearchGate page

Guillaume Martin, Full-time researcher at INRA, France. Editor of Agricultural Systems. ResearchGate page

Handling Editor for Agricultural Systems: Guillaume Martin

Call for Submissions for a Special Issue in Agricultural Systems:

Farm system models and modelling: levers for linking society and the land for sustainable development – data, design, usability and interoperability

Description of the Special Issue:

Farmers cultivate the land and manage trees, crops, animals and the surrounding landscape to produce the products and services needed to sustain human life. Thereby, farmers link society to the land. Their decisions are influenced by their own resources and capabilities, the biophysical environment and the information and incentives received from the socio-institutional and economic environment. Assisting their decision-making in the complex agricultural system is essential for farmers and society alike to reach their goals.

This SI will provide an overview of the state-of-the-art in farm system models and modelling and will explore the challenges and opportunities of farm modelling. Submissions that address one of more of the following questions are invited:

- Are current modelling tools equipped to deliver sufficient support? How are quantitative and qualitative aspects of farm analysis and modelling combined? How are indicators of non-commodity functions of agroecosystems and cultural aspects of farming implemented and used?
- How should the development of farm models evolve in light of increased needs for support regarding more complicated and complex problems and the need for science rigour? How do the demands for more complex agroecological solutions interact with these needs? Given that application in policy settings generally requires a degree of parsimony, how is this reconciled as models become more complex?
- The demand for models that represent integrated farming systems is increasing. Particular needs include but are not limited to: multi-species models that deal with above and below-ground competition and changes in composition during the year; modelling multiple species of farm animals and their interactions (both competitive and complementary); explicit inclusion of pests and diseases in the farm system or between farm systems.
- How do farm system models address equity, fairness and justice principles in their analysis, and is the availability of farm data and models equitable across geographical regions and application domains?
- Farm models are used in different modes for simulation and analysis/evaluation, decision support, scenario studies, and policy development. Beyond the individual farm level, farm models are frequently used in participatory settings. Which affordances (see https://doi.org/10.1016/j.agsy.2018.03.006) are needed for the different purposes?
- There is a large need for contributions of farm analysis to scenario studies and assessments of transitions at larger scales. What is the place of farm models in model ensembles or portfolios, how is the interoperability of different types of models operating at different spatial and temporal scales?
- Big data is becoming more available. How can farm modelling benefit from, and contribute to, integrated analysis of these data?

- Formal validation of farm models is difficult to impossible. What validation and testing methods carry sufficient science rigour? How does the availability of large quantities of lower-quality data affect validation and testing? How does the intended use, size and diversity of the user community affect testing and validation needs?

In contrast to some other disciplines, the agricultural modelling community lacks a standard for describing models and model application studies. A standard would be highly desirable to improve the rigour and transparency of agricultural systems modelling. Such a standard will be developed in the early stages of this Special Issue and papers published in the Issue will be expected to use this standard to support the description of their work.

This Special Issue will bring together a collection of original research manuscripts and reviews presenting contrasting conceptual and methodological approaches and applications of farm modelling to address the points above and to describe various model implementations pathways. We also invite manuscripts describing new or updated models widely used in the farm systems research community. Submissions of manuscripts on relevant topics are sought to present a wide range of issues, examples and solutions.

All submissions are *via* Elsevier's Agricultural Systems website – follow the "Submit your article". All submissions will go through the standard review and editorial processes for Agricultural Systems and must fit within the scope of the journal as well as the aim of this Special Issue.

As early as practicable, authors should submit a short description of their planned manuscript for advice from the SI Guest Editors regarding fit with the SI and journal scope. Please address inquiries to: FarmSystemsSI@gmail.com (this address will be monitored at least weekly) or contact any of the Guest Editors.

Manuscript submission:

- Submission of manuscripts opens: 1 December 2019
- First submission of manuscripts closes: 31 May 2020
- Manuscripts will be published online as they are accepted following the usual review procedures
- Final publication of the Special Issue: September-November 2020

Guest Editors:

Dr Jeroen Groot – Associate professor at Farming Systems Ecology group of Wageningen University & Research, and Senior Expert to the CGIAR (Bioversity International and CIMMYT). ResearchGate Score: 35.13.

Dr Pablo Modernel – Postdoctoral Researcher at the Animal Production Systems group of Wageningen University & Research. ResearchGate Score: 10.69.

Dr Val Snow – Agro-ecosystems modeller at AgResearch in New Zealand, and co-Editor-in-Chief of Agricultural Systems. ResearchGate Score: 32.32.

Handling Editor for Agricultural Systems: Val Snow

Five PhD student positions in the PERSWADE Center

(https://www.uts.edu.au/perswade)

$27,082 min per annum – Tax Free Scholarship Award, and a tuition waiver fee for qualified candidates.

Three Open Topic Positions

Center on Persuasive Systems for Wise Adaptive living (PERSWADE) is seeking outstanding PhD candidates who have transdisciplinary background and are passionate about turning scientific knowledge into action.

The research can focus on one of the following topics, depending on your interests and skills:

- Systems of systems, network of networks – how uncertainty propagates across scales in systems?
- Dynamics of public opinion in a changing environment – how analyzing social media we can understand behavior and preferences and how can we influence them?
- Standards and documentation -- how do we make our models and modeling process (including participatory modeling) reproducible, how can we learn from it, and how can we make such standards adopted by the modeling community?
- Networks and cascades of power – if the rich get richer and the poor get poorer, how can the system change?
- Optimization of socio-technical systems – what can we achieve if behavior change is one of the control parameters, which can be changed along with design and performance of supply systems?

Particular applications will be tailored to the interests and passions of the student, but will be concerned with such topics as resource scarcity, climate change, food security, energy efficiency, health and healthcare, etc.

Two Thematic PhD Positions

PhD1 'Disasters and urbanization': Natural disasters impact individuals, communities and cities across Australia on a regular basis. Bushfires, storms and floods may have catastrophic consequences, especially in urban and sub-urban areas with high density of population and properties. The growing frequency and severity of these hazards and the booming population trends call for smart urban expansion strategies, which support socio-economic resilience and minimize expected losses. Engagement of various stakeholders and search for synergies between private and public adaptation actions becomes central in the agenda of the Australian government, calling for the development of economic tools to quantify the impact of adaptation actions at various levels. While individual level actions – such as purchasing insurance, hazard-proofing a house and relocating to a safer place – reduce expected damages and improve resilience, this autonomous adaptation has limits. To be able to assess where these limits are, how they change over time, and how public policies can enhance autonomous adaptation, we need to quantify aggregated impacts of autonomous adaptation. This PhD project will develop a computational spatial agent-based model that traces the impacts of public and private adaptation to climate-driven hazards. This simulation model will

serve as an aggregation vehicle to trace changes in damages across scales as individuals and communities dynamically adapt to natural hazards. We focus on the impact on the housing sector since losses to real estate constitute the largest share of the direct damage from catastrophic events such as bushfires, storms and floods.

PhD2 'Housing bubbles and economic expectations': Housing markets are vital in supporting and redistributing wealth. Given unprecedented urbanization one could expect increase in property and land prices that potentially undermine inequality. At the same time, housing markets are known to experience sudden crashes raising the question about macro and microeconomic forces shaping economic bubbles. Price expectations of heterogenous economic agents and their interactions along the economic and social networks drive markets dynamics from the bottom up. At the same time, macroeconomic cycles also influence the housing sector. This PhD project will develop computational agent-based models to study economy as an adaptive complex system, focusing on housing markets in particular.

University of Technology Sydney School of Information, Systems and Modeling addresses complex environmental, societal and engineering issues by merging quantitative and qualitative methods. It explores the interfaces between people and systems to improve the effectiveness of enterprises, management and policy making through innovation in technology and communication.

Desired qualifications and skills

Depending on the particular topic that you choose to explore, we expect you to have a combination of some of the following skills:

- expertise and prior experience in social computing research, particularly with conceptual modeling of users' behavior on social media platforms;
- solid knowledge of simulation modeling, experience in system dynamics, social network analyses, Bayesian modeling or agent based modeling;
- design and analyses of surveys, good statistical skills;

Besides, all candidates should have:

- Excellent master's degree or bachelor's degree with honors in applied computer science, quantitative social sciences or environmental sciences;
- Practical experience with socio-environmental applications;
- Programming skills and experience with visualization and usability techniques;
- Excellent written and spoken English;
- Ability to work independently as a researcher and effectively in a team.

The scholarships carry a basic remuneration of $27,082 tax-free and waivers of the full-time research student fees. There are no restrictions on the nationality of the applicants and the selection will be based on the candidate's qualifications and experience.

How to apply

Interested candidates should follow the application procedure listed on the University of Technology Sydney's web pages: https://www.uts.edu.au/research-and-teaching/research-degrees/applying-uts/how-apply
and apply following this link:
https://msa.uts.edu.au/eStudent/S1/eApplications/eAppLogin.aspx?f=UTS.WAP.LOGIN.WEB.

Before the formal application please send: (1) a cover letter with your motivation to pursue PhD, (2) one page description of your research idea along the lines of the above-mentioned topics and (3) your CV with a list of publications and names of three referees to the emails below. For the Open topic positions please contact Prof. Alexey Voinov - Alexey.Voinov@uts.edu.au
For the Thematic positions please contact Prof. Dr. Tatiana Filatova - Tatiana.Filatova@uts.edu.au.

Positions will be open until filled. To be eligible for starting in July 2020, please apply before December 15, 2019. The positions will remain open until filled. Please check UTS application deadlines here (https://www.uts.edu.au/research-and-teaching/research-degrees/applying-uts/application-deadlines**).**

TEXAS A&M UNIVERSITY
DEPARTMENT OF SOIL AND CROP SCIENCES

TEXAS A&M AGRILIFE RESEARCH

Job Opportunity: Asst. Professor (TT)
Soil Hydrology / Pedology / Water Physics

Description

The Department of Soil & Crop Sciences, College of Agriculture and Life Sciences at Texas A&M University seeks an Assistant Professor of Soil Science with experience in surface and soil hydrology and its relationship to healthy and secure soil resources. The successful candidate is expected to provide vision and leadership for an internationally recognized research and teaching program that will address management and ecosystem service contributions of **hydrologically healthy** and **secure soil systems**. The incumbent will develop a research program addressing critical challenges to soil health and security using **technically innovative, field-based methods at the intersection of soil physics, hydrology, and pedology**. Specific areas of emphasis may include evaluating and modeling the spatial and temporal changes to dynamic soil physical properties; quantifying changes to field-scale hydrology associated with land use change and management practices; and/or assessing the impacts of on-farm soil health practices on off-site ecosystem services. The incumbent will have a commitment to teaching, the ability to secure extramural funding sufficient to sustain a vibrant research program that includes the training of undergraduate and graduate students, publish in top-tier journals in his or her field, and the ability to meet expectations of a land grant institution. Teaching responsibilities will include two undergraduate courses, Soil Judging (SCSC 489) and Soil Morphology (SCSC 310) and one graduate course, Pedology (SCSC 605) and other courses as appropriate. Additional responsibilities include advising graduate students and participating in the Departmental, College and University service. The successful candidate must have demonstrated effectiveness in research, written and oral communication, and must be able to interact productively with scientists from other disciplines. An interest and ability to work in an interdisciplinary team research and instructional endeavors is essential. The position is a full-time, tenure track, 9-month appointment; 70% research; 30% teaching. This faculty position will require an educational and research background in soil science. Information about the Department of Soil and Crop Sciences is available at http://soilcrop.tamu.edu/.

Qualifications
A Ph.D. in soil science or a closely related discipline with training/industry experience in soil science is required. The successful candidate must have demonstrated effectiveness in research, written and oral communication, and must be able to interact productively with scientists from other disciplines. Experience in soil science, research grant development, and the use of multi-disciplinary systems approaches to solve soil health: hydropedology.

Application Instructions
Applicants must submit the following, preferably in PDF format: 1) Cover Letter (up to 2 pages) that explicitly addresses qualifications for each required/desired criterion; 2) a current curriculum vitae; 3) a two-page statement on teaching and research relative to the position and College of Agriculture and Life Sciences; and 4) three reference letters.

For questions, email inquiries to: Dr. Paul Schwab, Search Committee Chair, Department of Soil and Crop Sciences, Texas A&M University, College Station at pschwab@tamu.edu

Initial deadline for receipt of complete applications is **January 15, 2020** but review will continue until the position is filled.

Texas A&M University is an Equal Opportunity/Affirmative Action/Veterans/Disability employer committed to building a culturally diverse educational environment. Applications from veterans, individuals with disabilities, women, minorities, and members of other underrepresented groups are strongly encouraged.

The University is aware that attracting and retaining exceptional faculty often depends on meeting the needs of two careers and therefore has a Dual Career Program and implements policies that contribute to work-life balance.

Position Description

Research only - Research Officer

Position No:	
Department:	Department of Animal, Plant and Soil Sciences
School:	Life Sciences
Campus/Location:	Melbourne (Bundoora) – position is to be based externally with CSIRO Toowoomba QLD
Classification:	Level A – Research Officer
Employment Type:	Full time end September 2022
Position Supervisor: **Number:**	Senior Lecturer 50144193
Other Benefits:	http://www.latrobe.edu.au/jobs/working/benefits

Further information about:

La Trobe University - http://www.latrobe.edu.au/about

School of Life Science, Centre for AgriBioscience – http://latrobe.edu.au/agribio

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For enquiries only contact:

Dr Marisa Collins, TEL: (03) 90327473 Email: Marisa.Collins@latrobe.edu.au

Position Description

Level A - Research Officer

A Level A research only academic is expected to contribute towards the research effort of the institution and to develop their research expertise through the pursuit of defined projects relevant to the particular field of research.

Position Context

Mungbean (Vigna radiata) is an increasingly important crop in farming systems in subtropical Australia, and the world. However, farmers often find grain yields of mungbean are disappointing and highly variable. Diagnosis of factors reducing yield has been difficult. Using crop simulation models is useful for diagnosing yield gaps, to explore critical stresses and yield limitations across environments, and to identify genotype by environment by management scenarios that may bring about improvements in grain yields and their reliability. The ability to use crop simulation more effectively to guide mungbean agronomic recommendations is hindered by inability to capture a greater diversity of cultivars (particularly newly released cultivars), and to integrate better those physiological factors that are driving yield development and phenology in the crop.

The postdoctoral fellow will conduct a project that will upgrade the current APSIM-Mungbean model and integrate this into the NexGen crop models being developed in APSIM currently. The main goals are to improve the ability to simulate differences amongst cultivars, and to develop greater functionality in terms of sensitivity to water and temperature stresses and drivers of canopy development. These additions will allow for extrapolation of field-based experiments from mungbean agronomy projects across a range of climatic and environmental conditions. This will allow for predictions of long-term optimal agronomic practices such as times of sowing to optimize crop harvest index and yield, flowering time to reduce heat or cold stress, and exploring the interactions of different irrigation strategies or soil water conditions.

The position is funded by the Grains Research and Development Cooperation and will interact closely with teams researching mungbean agronomy and physiology. The PDF will be employed by La Trobe University and hosted and supervised by CSIRO's farming systems modelling team based in Toowoomba/Gatton QLD.

Duties at this level may include:

Under the direction of senior research scientists and engineers, postdoctoral fellows will:

- Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
- Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research.
- Record, manage, and analyse data/information using relevant domain data science techniques.
- Carry out research investigations requiring originality, creativity and innovation.
- Proactively undertake development to grow effective researcher capabilities to support career goals.
- Adhere to the spirit and practice of relevant (CSIRO and La Trobe's) codes of conduct, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.

This position will have specific responsibilities to:

- Coordinate collection and review of data from mungbean physiology and agronomy experiments.

- Develop and test a Mungbean module in APSIM NextGen in collaboration with the APSIM development team
- Engage with other researchers and industry to conduct simulation analyses to address key agronomic management issues to optimise mungbean grain yields and reliability.
- Produce client reports & scientific papers suitable for publication in journals.
- Present research findings to collaborating farmers, advisors and research partners
- Prepare appropriate conference papers and present those at conferences.
- Undertake limited administrative functions primarily connected with the area of research.
- Undertake other duties commensurate with the classification and scope of the position as required by the Head of Department or Head of School.

Key Selection Criteria

- A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as agricultural science, crop or forage physiology, systems modelling.
- A history of professional and respectful behaviours and attitudes in a collaborative environment.
- High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including publishing scientific papers in peer reviewed journals and/or reports, and presenting at national and/or international conferences.
- Evidence of experience in research and evaluation and the ability to work effectively under limited supervision or independently
- A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

Desirable Criteria:

- Demonstrated understanding of plant physiological processes important in grain crops.
- Experience with development and/or application of crop models.
- Familiarity with grain legume agronomy, physiology and modelling.
- Appreciation for and experience in communicating and engaging with diverse stakeholders in research.
- Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
- The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.

Other relevant information:

- The position description is indicative of the initial expectation of the role and subject to changes to University goals and priorities, activities or focus of the job.

Essential Compliance Requirements

To hold this La Trobe University position the occupant must:

- hold, or be willing to undertake and pass, a Victorian Working With Children Check; AND
- take personal accountability to comply with all University policies, procedures and legislative or regulatory obligations; including but not limited to TEQSA and the Higher Education Threshold Standards.

La Trobe Cultural Qualities

Our cultural qualities underpin everything we do. As we work towards realising the strategic goals of the University we strive to work in a way which is aligned to our four cultural qualities:

- We are ***Connected****:* We connect to the world outside — the students and communities we serve, both locally and globally.
- *We are* ***Innovative****:* We tackle the big issues of our time to transform the lives of our students and society.
- *We are* ***Accountable:*** We strive for excellence in everything we do. We hold each other and ourselves to account, and work to the highest standard.
- *We* ***Care:*** We care about what we do and why we do it. We believe in the power of education and research to transform lives and global society. We care about being the difference in the lives of our students and communities.

For Human Resource Use Only

Initials: Date: