

Making science useful to agriculture

Adelaide, 26-29 November 2018

University of Adelaide, North Terrace Campus

Horace Lamb Room 422



Foreword

The challenges for global agriculture in the next two decades are¹: (1) for all at all times, abundant, affordable, healthy and nutritious food; (2) for farmers, comfortable stable incomes, in line with the rest of society, from sustainable farming with less drudgery; (3) for the non-farm environment, absence of encroachment and of contamination by farming; (4) for the rural communities, viable support and attractive landscapes; and (5) for the world, maintenance of non-agricultural biodiversity.

Meeting these challenges requires focused investment of scarce R&D resources, and managing the tension between formal economic evaluation of alternative investments and fostering ingenuity, serendipity and scientific entrepreneurship². An implicit assumption in the assembly of R&D portfolios is that the underlying science is sound.

This workshop will discuss the investment of limited resources to R&D in agriculture, illustrate instances where reductionism, oversimplification or plain lack of rigour compromise the outcome of these investments, and highlight cases where genuine multidisciplinary research reduces the risk of misconstructured science.

Victor Sadras

Adelaide, November 2018

1 Fischer, R. A. & Connor, D. J. Issues for cropping and agricultural science in the next 20 years. *Field Crops Res.* 222, 121–142 (2018).

2 Alston, J. M., Norton, G. W. & Pardey, P. G. *Science under scarcity: principles and practice for agricultural research evaluation and priority setting.* (Cornell University Press, 1995).

Acknowledgements

Pedro Aphalo, Ford Denison, Peter Langridge and Victor Sadras conceived and developed this project.

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Monday 26 November. Investing in R&D

Chairs

Morning, Kathy Ophel-Keller; Afternoon, Richard Gray

0800-0900		Registration
0900-0910	Victor Sadras	Welcome
0910-0940	Primal Silva	OECD Co-operative Research Programme: Biological Resource Management for Sustainable Agriculture Systems
0940-1030	Victor Sadras	Reductionism, over-simplification and plain lack of rigour can misguide R&D investment
1030-1110	Julian Alston	Science under scarcity: principles and practice for agricultural research evaluation and priority setting
1110-1140	Coffee break	
1140-1220	Richard Gray	Decision making in producer controlled research organizations
1220-1250	Alan Mayfield Malcom Buckby	SAGIT funding of agricultural research
1250-1310	Peter Appleford	SARDI Perspective
1310-1410	Lunch	
1410-1440	Stephen Loss Francis Ogbonnaya	Investing in R&D to create enduring profitability for farmers
1440-1540	Bill Long	Farmer perspective
1540-1700	Discussion over coffee	
1830-2000	Welcome drinks	Wined Bar, National Wine Centre of Australia

- 1) What is the state-of-the-art in the methods of funding allocation to R&D in agriculture? What makes successful research and what leads to waste and failure?
- 2) Comparison of different models and scales; state, national, international.
- 3) How to manage the trade-off between socially and economically sound investment requiring priority setting, and encouraging scientific entrepreneurship, creativity, serendipity and innovation?
- 4) IP issues in public/private research, help or hindrance.
- 5) How to manage the trade-off between collaboration and competition?
- 6) Peer-review of research funding proposals, pros and cons. How can it be improved?

Tuesday 27 November. Failure and success in crop improvement

Chairs

Morning, Renee Lafitte

Afternoon, Tony Fischer

0900-0940	Peter Langridge	State-of-the-art in genetic resources
0940-1020	Pedro Aphalo	The importance of context in plant biology
1020-1100	Ford Denison	Evolutionary trade-offs as constraints and opportunities
1100-1140	Coffee break	
1140-1220	Jill Lenne	Scientifically sound conservation of genetic resources for crop breeding
1220-1300	Renee Lafitte	Searching for transgenes that improve yield: promise and reality
1300-1400	Lunch	
1400-1440	Martin Kropff ?	TBC
1440-1520	Tony Fischer	Expensive distractions on pre-breeding research
	John Passioura	TBA
1520-1700	Discussion over coffee	
1900-2200	Workshop dinner	Majestic Roof Garden Hotel, 55 Frome Street

- 1) Misconceptions in scientific research impacting the return of R&D investment; focus in breeding.
- 2) Critical comparison of “Gene-first” and “phenotype-first” models. Can we improve return from R&D investment with a more nuanced definition of phenotype?
- 3) Progress in plant breeding. state-of-the-art in quantifying genetic and environmental components of phenotypic variance. The role of models.
- 4) Avoiding expensive distractions in pre-breeding research and plant breeding – can we identify them?
- 5) Private plant breeding and global monopolies

Wednesday 28 November. Failure and success in agronomy

Chairs

Morning: Tim Reeves

Afternoon: David Connor

0900-0940	Holger Kirchmann	Why organic agriculture is not the way forward
0940-1020	Megan Ryan	Little evidence that farmers should consider abundance or diversity of arbuscular mycorrhizal fungi when managing crops
1020-1100	Ines Minguez	Simple indicators, society concerns, and scientific rigour: the example of the water footprint
1100-1140	Coffee break	
1140-1220	Peter Hayman	Climate change – downscaling
1220-1300	Daniel Rodriguez	Farming Systems of Australia and Africa
1300-1400	Lunch	
1400-1440	John Porter	Identifying model improvement through yield and resources use efficiency identities
1440-1520	John Kirkegaard	TBC
1520-1700	Discussion over coffee	
1900-2230	Dinner	

- 1) Misconceptions in scientific research impacting the return of R&D investment; focus in agronomy.
- 2) Critical comparison of production systems with emphasis on water and nutrients.
- 3) Avoiding expensive distractions in agronomy – can we identify them?
- 4) Genuine multidisciplinary research to avoid misconstructured science.
- 5) Peer-review and the role of journals setting agendas.
- 6) University drivers (ARC drivers, university rankings, overseas student recruitment, high-cits, H-indexes etc) on staff focus.

Thursday 29 November. Integrating discussion

0900-1200	Final discussion	Chair: John Passioura
1200-1215	Close	Primal Silva
1215-1330	Lunch	

Outcomes of final discussion

- CRP perspective
- Survey of participants
- Main findings of workshop: initial summary
- Consolidated set of papers for proceedings
- Single, multi-author paper