# Association for the Advancement of Animal Breeding and Genetics



Proceedings of the Twenty-fourth Conference

# Widening the range of technologies used in animal breeding and genetics

Guest Editor: Susan F. Hatcher

This AAABG Special Issue of *Animal Production Science* contains invited full papers that will be presented and discussed during the conference. In addition, there are over 115 short communications that are available via the AAABG website.

> Online with local hubs in Australia (Brisbane, Qld; Armidale, NSW; Melbourne, Vic.; Adelaide, SA; Perth, WA) and New Zealand (Dunedin) 2–4 November 2021

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ISSN 1836-0939 eISSN 1836-5787

### **Refereeing of Papers**

The papers in this volume have been refereed to the journal standards. The material is subject to copyright and may not be presented elsewhere.

The criteria for acceptance of papers are that the material should address both the conference theme 'Widening the range of technologies used in animal breeding and genetics' and the AAABG objectives. The conference theme encompasses the many new tools, ranging from novel methods for developing additional phenotypes to innovative molecular approaches to increase the accuracy of genetic selection, which are now available to improve animal breeding programs. Material presented in the papers must be of interest to AAABG members and industry, be sound and advances scientific knowledge in the field of animal breeding and genetics. It is also expected that one of the authors of a paper would present the material as an oral or poster presentation at the conference.

## **Ethical Clearance**

It is incumbent upon the authors, where necessary, to have had experiments approved by a relevant animal ethics committee.

## Authenticity

The Journal assumes that the authors of a multi-authored paper agree to its submission. The Journal has used its best endeavours to ensure that work published is that of the named authors except where acknowledged and, through its reviewing procedures, that any published results and conclusions are consistent with the primary data. It takes no responsibility for fraud or inaccuracy on the part of the contributors. For submitted manuscripts, unpublished data and personal communications the Journal assumes that the authors have obtained permission from the data owner to quote his or her unpublished work.

#### **Citation of Papers**

These papers were presented at the 24th conference of the Association for the Advancement of Animal Breeding and Genetics (AAABG) held online with local hubs in Australia (Brisbane, Qld; Armidale, NSW; Melbourne, Vic.; Adelaide, SA; Perth, WA) and New Zealand (Dunedin) (2–4 November 2021).

Invited papers are published in a special issue of Volume 61 of Animal Production Science.

Papers should be cited as: *Animal Production Science* **61** (followed by the page numbers). or in the abbreviated form: *Anim. Prod. Sci.* **61** (followed by the page numbers).

# The Association for the Advancement of Animal Breeding and Genetics

The Association for the Advancement of Animal Breeding and Genetics (AAABG) is a professional organisation based in Australia and New Zealand for livestock scientists, breeders, educators, students and industry service providers. AAABG's origin can be traced back to the 3rd International congress of SABRAO (Society for the Advancement of Breeding Researches in Asia and Oceania) held in Canberra, ACT, during February 1977. The SABRAO Congress attracted a significant proportion of Australian genetics and animal breeding research workers, and the success of the meeting prompted the suggestion of a need for regular meetings as many of the researchers worked individually or in small disparate groups (Barker 1979). Drs James Barker, Peter Mullaney and Keith Hammond were invited to form a Steering Committee to formulate a proposal to establish a scientific society.

A workshop, Improving the Servicing of Animal Breeding Programs in Australia, in Armidale during July 1979, concluded 'Communications problems exist between all organisations and individuals concerned with breeding programs, but particularly between animal geneticists and industry' (Barker 1979). This prompted the Steering Committee, who were in attendance, to suggest the scientific society they were charged with initiating should specifically include breeders and industry organisations, as well as research workers. An informal meeting of animal geneticists during the 12th Biennial Conference of the Australian Society of Animal Production in February 1978 accepted the suggestion and proposed that the Steering Committee:

- a. invite at least one industry representative to join the Committee, and invite corresponding members from each of the major centres of animal production in the country;
- b. decide on a tentative name and prepare a draft constitution;
- c. solicit members;
- d. establish the financial basis of the organisation;
- e. stage an inaugural conference of the organisation in 1979; and
- f. hold a general meeting during this conference to approve a name for the organisation, ratify a constitution and elect the office bearers (Barker 1979).

Mr Ryves Hawker and Mr James Litchfield joined the Steering Committee as industry representatives, as did Dr Rod Ryan who represented intensive animal industries. The inaugural AAABG conference was held at the University of New England, Armidale NSW, in 1979.

The major activity conducted by the AAABG to achieve its objectives is an international conference held at approximately 2-year intervals. The principal objectives of the AAABG are to:

- i. promote scientific research on the genetics of animals;
- ii. foster the application of genetics in animal production; and
- iii. develop communication among all those interested in the application of genetics to animal production, particularly breeders and their organisations, consultants, extension workers, educators and geneticists.

## Reference

Barker JSF (1979) A new initiative in the application of animal genetics in Australia. *Proceedings of the Association for the Advancement of Animal Breeding and Genetics* 1, 2–6.

## **President's Message**

On behalf of the organising committee, I extend a very warm welcome to the 24th Conference of the Association for the Advancement of Animal Breeding and Genetics. The format of this conference is necessarily different from earlier conferences, in response to the impact of the COVID-19 pandemic and associated restrictions. Delegates are participating from hubs in a number of locations, but also online. The theme of the 24th Conference is 'Widening the range of technologies used in animal breeding and genetics' with an emphasis on the many new tools that are now available to improve animal breeding programs. These tools range from novel methods for developing additional phenotypes to innovative molecular approaches to increase the accuracy of genetic selection. Despite the changed conditions that many delegates have found themselves working under during the past 18 months, I am delighted to note that this has not slowed down the contribution of papers to AAABG. Overall, we have well over 140 papers for presentation at the 24th conference. These include:

- the 2019 Helen Newton Turner Oration by Dr Kevin Atkins;
- 28 full-article papers published in a special edition of the journal Animal Production Science; and
- over 115 short communication papers published in the AAABG conference proceedings that will appear on the AAABG Home page.

All delegates registered for the 24th AAABG conference will have full digital access to all papers, with the full text of special issue articles available via a password. The short communication papers will also be available at a later date from the AAABG Home page. In addition, all recordings of presentations of talks will be available, once initially presented, to all registered delegates for a period of up to 3 months after the conference.

The central day of this year's conference is a Breeder day. The organising committee decided to put it in the middle of the 3-day conference, to highlight the importance of addressing one of the main objectives of the AAABG, which is 'to promote communication among all those interested in the application of genetics to animal production, particularly breeders and their organisations, consultants, extension workers, educators and geneticists'. All organising committees grapple with how to effectively meet this objective. Our attempt, taking place during the COVID-19 pandemic, although not as large as originally planned for at the Adelaide Convention Centre, should provide some learnings for future conferences to consider.

The organising committee is grateful for the ongoing support of sponsors, especially for staying with us following a change to the conference format. We are also indebted to the Adelaide Convention Centre and the Adelaide Wine Centre, who returned all funds paid following cancellation of our venue bookings. Our thanks also to organisers of hubs, who have taken on responsibility for making arrangements at a local level so that delegates have the option to meet together close to their home location to participate in the conference. Finally, I thank members of the conference organising committee and Dr Sue Hatcher, our AAABG Editor, for all their hard work in making the 24th AAABG Conference possible. I am honoured to have had the privilege of being President of AAABG and leading the organising committee for the 24th Conference.

Forbes Brien

President

# Twenty-fourth AAABG Conference Committee

President	Forbes Brien	
President Elect	Bronwyn Clarke	
Vice President	Wayne Pitchford	
Secretary/Treasurer	Chantal Barrass	
Editor	Sue Hatcher	
Ordinary Committee Members	Lynton Arney	
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	Michelle Hebart	
	Stefan Hiendleder	
	Stephen Lee	
	Rudi McEwin	
	Judith Pitchford	
	Penny Schulz	
	John Williams (overseas member)	

Professional Conference Organiser

Event Studio

# **AAABG Presidents**

Year	Name	Conference location
1979	J. S. F. Barker <sup>A</sup>	UNE, Armidale, NSW
1981	J. S. F. Barker	UM, Melbourne, Vic.
1982	R. Hawker	UQ, Brisbane, Qld
1984	R. Hawker	UA, Adelaide, SA
1985	J. James	UNSW, Sydney, NSW
1987	R. R. Howe	UWA, Perth, WA
1988	J. Nivison	UNE, Armidale, NSW
1990	N. Clarke	Hamilton and Palmerston North, New Zealand
1991	T. Liley	UM, Melbourne, Vic.
1992	J. Vercoe	UCQ and CSIRO Tropical Cattle Research Centre, Rockhampton, Qld
1995	P. England	UA, Roseworthy, SA
1997	R. Barlow	Dubbo, NSW
1999	B. Sandilands	Mandurah, WA
2001	D. Garrick	Queenstown, New Zealand
2003	A. McClintock	Melbourne, Vic.
2005	H. Burrow	Noosa Lakes, Qld
2007	J. van der Werf	UNE, Armidale, NSW
2009	W. Pitchford	Barossa Valley, SA
2011	J. Greeff	UWA, Perth, WA
2013	H. Blair	Napier, New Zealand
2015	M. Goddard	Lorne, Vic.
2017	T. Reverter	Townsville, Qld
2019	K. Bunter	UNE, Armidale, NSW
2021	F. Brien	UA, Online

<sup>A</sup>Chairman of Steering Committee.

## Fellows of the Association for the Advancement of Animal Breeding and Genetics

'Persons who have rendered eminent service to animal breeding in Australia and/or New Zealand or elsewhere in the world, may be elected to Fellowship of the Association.'

Elected February 1990	Elected September 1992		
R. B. M Dun	K. Hammond		
F. H. W. Morley			
A. L. Rae			
H. N. Turner			
Elected July 1995	Elected February 1997		
C. H. S. Dolling	J. S. F. Barker		
J. R. Hawker	R. E. Freer		
J. Litchfield			
Elected June 1999	Elected July 2001		
J. Gough	J. N. Clarke		
J. W. James	A. R. Gilmour		
	L. R. Piper		
Elected September 2005	Elected September 2007		
B. M. Bindon	K. D. Atkins		
M. E. Goddard	R. G. Banks		
HU. Graser	G. H. Davis		
F. W. Nicholas			
Elected September 2009	Flected September 2011		
N. M. Fogarty	B P Kinghorn		
A. R. Fyfe	A McDonald		
J. C. McEwan			
R. Mortimer			
R. W. Ponzoni			
Elected October 2013	Elected October 2015		
H. M. Burrow	P. F. Arthur		
P. F. Fennessy	D. Johnson		

G. Nicol

P. Parnell

K. Meyer B. Tier

R. Woolaston

Elected October 2019	Elected November 2021	
S. A. Barwick	F. D. Brien	
H. T. Blair	D. Garrick	
S. W. P. Cloete	J. Greeff	
I. W. Purvis	B. Hayes	
	J. E. Pryce	
	J. H. J. van der Werf	

## Honorary members of the Association for the Advancement of Animal Breeding and Genetics

'Members who have rendered eminent service to the Association may be elected to Honorary Membership.'

**Elected September 2009** W. A. Pattie

J. R. W. Walkley

## Fellows elected 2021



#### **Forbes Donald Brien**

Associate Professor Forbes Brien was raised on a mixed farming property at Birregurra near Colac in Victoria. His secondary school years were at Colac High School and Wesley College. He was part of the family farm partnership until 1995. After selling the family farm, Forbes and his wife Christine purchased a 650-ha sheep and cattle grazing property at Nareen Victoria and sold it in 2006.

He completed both an Agricultural Science degree and a Masters majoring in sheep reproductive physiology at Melbourne University. Forbes worked for the Victorian and South Australian State Governments both twice. He started with the Victorian Department of Agriculture after completing his degree. He was initially based at Werribee where he also completed his Masters. During 1977-1979 Forbes was in training as a Sheep Industry Advisory Officer at Ballarat and then in 1979 he began as a Sheep Industry Officer at Warrnambool. He was awarded a postgraduate scholarship from the Australian Wool Research and Development Council and spent 1981 to 1985 undertaking his PhD at University of Edinburgh in Scotland. There he combined his interests in reproductive physiology and productivity by studying the genetics of reproduction and feed efficiency using mice as a model species. The work still has relevance today as evidenced by the number of attempts to repeat similar work.

Forbes returned to the Victorian Department as a Livestock Research Officer based at Hamilton. In 1987 he moved to South Australia and commenced work as the National Coordinator of WOOLPLAN. This was a perfect way to combine his skills in Merino sheep, genetics and extension. However, it was also a very difficult role where the majority of Merino breeders and their commercial clients saw little relevance in objective measurement. In 1994 he was appointed Program Manager, Wool in Primary Industries SA, and in 1995 Chief Scientist, Livestock Systems in South Australian Research and Development Institute.

In 1998 Forbes was appointed Resource Manager, Animal Science at the Pastoral and Veterinary Institute, Hamilton Victoria and this facilitated the move to the farm at Nareen. He held another two leadership positions within Agriculture Victoria before returning in 2004 to SARDI as Principal Research Scientist, Livestock Breeding and Genetics including Leader of Turretfield Research Centre. He worked closely with University of Adelaide colleagues during this time and was appointed to his current position of Research Associate Professor in 2013.

Forbes has been a member of AAABG since 1991 and was on the organising committees of three conferences in South Australia. He has served as Vice President and is the current President. He is a true industry servant in that he understands the needs of seedstock and commercial breeders and has spent his whole career committed to industry development including some genuinely tough leadership positions and periods.

For his outstanding contributions to quantitative genetics and breeding, and in particular for his management and advisory work in the wool industry, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Forbes Brien as a Fellow of the Association..



**Dorian Garrick** 

Dorian began his research career at Massey University after graduating from a BAgrSc degree with First Class Honours. His predoctoral research investigated some of the first applications of animal model prediction methodologies developed at Iowa State and Cornell Universities to sheep and swine improvement. He obtained a Fulbright scholarship and the prestigious Andrew D. White Fellowship to undertake a PhD at Cornell University where he worked on the use of pedigree and performance information from field data for prediction of genetic merit and estimation of variance components.

Dorian returned to Massey University after 3 years at Cornell and began teaching undergraduate and graduate students while extending his research from sheep and pigs to improvement of dairy cattle, trees and other livestock species. His work led to the development of new approaches to national evaluation in dairy cattle and sheep including across-breed animal model prediction and web-accessible systems for on-demand turn key evaluations. He was appointed as a Full Professor at Massey University at age 34 years, to a position named after Massey University's A. L. Rae who pioneered scientific approaches to sheep improvement.

In 2002 Dorian took up a 9-month professorial position at Colorado State University and became a part-time employee at Massey University. In 2007 he took up the inaugural appointment to the Lush Endowed Chair at Iowa State University. Dr J. L. Lush wrote the first textbook on Animal Breeding in 1937 and is world-recognised as the father of animal breeding. Professor A. L. Rae was a PhD student at Iowa State University and studied under Dr Lush. Dorian returned to New Zealand in 2016 to lead the development of the A.L. Rae Centre for Genetics and Breeding on the AgResearch Ruakura Campus, Hamilton.

For his outstanding contributions to the science of genetics and animal improvement, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Dorian Garrick as a fellow of the Association.



Johan Greeff

Johan Greeff was born and raised in South Africa. His career in quantitative genetics began as a Research officer at the Animal and Dairy Science Research Institute, Irene, Pretoria, South Africa in 1976. In 1985 he became the leader of Sheep Genetics Research Unit with the responsibility of both conducting research and implementing the research results in industry. After completing his PhD with the University of Pretoria in 1992 he successfully applied for the Geneticist's position at the Great Southern Agricultural Research Institute in Katanning, Western Australia in 1993. In 2001 he was appointed Project Leader of Sheep Breeding Research and in 2002 Genetics Extension activities were added to his portfolio. During this time Johan was also Project Manager for the Breeding for Worm Resistance program in the Sheep CRC from 2000 to 2006. In 2009 he became Project Manager for the Sheep Welfare and Production project in the Department of Agriculture and Food WA.

Johan has worked tirelessly for the good of not only the Western Australian Sheep Industry – but the industry as a whole. In his time in WA (28 years) he has overseen the Katanning Base Flock (representing Merino Genetics from all over the state), the Rylington Merino flock (working on resistance to internal parasites), the breechstrike flock (pioneering the work on odour and fly strike), the CRC Information Nucleus Flock (INF) and now the MLA resource Flock. As part of his work with the INF, he was one of the first to estimate genetic parameters for methane production use short-term measurements of methane. He has also been instrumental in the continuation of the Yardstick Sire evaluation flock in WA. Initially using parameters from the Katanning Base Flock, Johan was able to carry out within flock genetic analysis for WA ram breeders before across flock analysis was available. He was then an advocate for a national across flock analysis. He helped many ram breeders set up to breed for resistance to internal parasites - some of these are still producing top rams for WEC nationally. Johan has often been the sole voice of Merino genetic research from WA – but has successfully kept the WA sheep industry included in many AWI and MLA funded genetics projects. Johan has always worked to put the interests of the industry in the forefront and listens to the needs of industry. In addition, Johan has quietly mentored DAFWA colleagues, supported post graduate students and assisted with teaching at Murdoch University, Curtin University and the University of WA, where he is an Adjunct Associate Professor.

Johan has been active in AAABG throughout his career, publishing and presenting many papers as well as being President for the 2011 Conference, held in Perth and Secretary for the 1999 Conference, held in Mandurah.

For his outstanding contributions to the science of genetics and animal improvement, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Johan Greeff as a fellow of the Association.



**Ben Hayes** 

Professor Ben Hayes is currently Centre Director, Animal Sciences, Queensland Alliance for Agriculture and Food Innovation (QAAFI), University of Queensland. Inspired by his grand-parents cattle property near Warwick, Ben did Animal Science at University of Queensland graduating in 1994. He did his honours project at CSIRO Rockhampton and published the results in a AAABG conference. Ben was then awarded a Beef CRC scholarship to do his PhD at University of Central Queensland under the supervision of Ross Shepherd and Scott Newman. His thesis was entitled "Mate selection for multi-breed beef cattle populations". During his PhD, he and Matt Kelly rented John Vercoe's house near Emu Park. During his PhD he spent time at Guelph with Steve Miller and at UNE Armidale.

After his PhD, Ben went to Melbourne to work with Mike Goddard at the Victorian DPI on a project looking at the use of genetic markers in pigs. During this time he was co-author on the ground-breaking genomic selection paper that has now revolutionised animal and plant breeding globally (Meuwissen THE, Hayes BJ, Goddard ME (2001) Prediction of total genetic value using genome-wide dense marker maps. *Genetics* **157**, 1819–1829). Then Ben was off to Norway to work on Salmon breeding at Norfina. But the dark of November in Norway took its toll and he returned to Victorian DPI as team leader of the genetics group. Here he expanded from livestock to plant breeding before returning to Queensland to his current position at QAAFI in 2016.

Professor Hayes has made many important contributions to animal breeding. He has helped Australian livestock and plant industries implement breeding programs which have increased their rate of genetic gain. Genomic selection is now widely used in animal and plant breeding. Ben led the Dairy Futures CRC genetics program which implemented genomic selection in the Australian dairy industry including introducing new traits such feed conversion efficiency. The value of the program has been recognised by a Cooperative Research Centres Association (CRCA) Award for Excellence in Innovation. Ben has also run courses on genomic selection around Australia and the world, which introduced many students and scientists to genomic selection.

Ben started the 1000 bull genomes project, a consortium of over 30 institutes across the globe, which has assembled whole genome sequences of 6191 cattle of over 200 breeds and which now provides the reference set of cattle genome sequences used throughout the world. It is hard to remember how outrageous it seemed at the time to talk about sequencing the genome of 1000 cattle when it had taken a huge effort to sequence one cow. While at QAAFI he has worked to develop genomic selection for the northern beef industry, particularly genomic EBVs for fertility that can be used in any breed. Ben is also helping the Bill and Melinda Gates Foundation with a project on dairy cattle in India and has projects on meta-genomics of rumen microbes and the breeding of wheat, barley and horticulture.

Ben is the author of more than 250 journal papers, including in *Nature Genetics, Nature Reviews Genetics*, and *Science*. He was a Thomson Reuters highly cited researcher in 2015, 2016, 2017 and 2018 and has a h-index of 85.

For his outstanding contributions to the science of genetics and animal improvement, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Ben Hayes as a fellow of the Association.



Jennie Elizabeth Pryce

Professor Jennie Elizabeth Pryce was born in 1972 in Shrewsbury, Shropshire, UK. She grew up on the family dairy farm and also bred her own Holstein cattle under the prefix Severnvale Holsteins. While attending High School and the Cheltenham Ladies College, she was also actively showing her cattle. Jennie had a very clear academic vision from the start of her career, a vision she has followed to this day. She is determined to improve dairy cattle through breeding with a focus on health, fertility, and environmental sustainability. After graduating with a BSc (Hons) from the University of Edinburgh in 1994, she completed a PhD at the same institution and Scotland's Rural College (SRUC). After her PhD graduation, Jennie remained a dairy geneticist with SRUC until 2001, when she moved to New Zealand to work for the Livestock Improvement Corporation and maintained strong research outputs. In 2008, she moved to Melbourne, to work for Agriculture Victoria and was later promoted to Principal Research Scientist and then Professor in 2019. Jennie helped develop the Feed Saved Australian breeding value released in 2015, the first dairy feed efficiency breeding value globally. More recently, she has lead projects on the application of using mid-infrared milk spectroscopy to predict key dairy traits, including fertility and important early-metabolic health assays, and, in another global first, the combination of genomics and metabolomics for dairy cattle selection. Jennie is a prolific author with more than 150 scientific journal articles gathering more than 1000 citations annually. She is an excellent and valued collaborator and her list of co-authors is a global who's who of dairy cattle geneticists and cattle scientists in general. Jennie has made strong contributions to scientific publishing as a Section Editor for the Journal of Dairy Science.

Jennie was the first recipient from outside the USA of the prestigious American Society of Dairy Science J.

L. Lush Award for Animal Breeding and Genetics. She and her team have also received awards from Agriculture Victoria on 'Excellence in Scientific Impact' for their work in demonstrating the value of genomics using onfarm data, MIR predictions of fertility. She received a 'Excellence in Leadership' award for her strong science leadership as measured from both scholarly and industry impact contributions. Indeed, Jennie has had a very high impact on the dairy industry in Oceania and abroad having been at forefront of major dairy genetics innovations and insights over the past 25 years. It is fair to say that she had a hand in all the main genetic innovations implemented by ADHIS and now DataGene over the past decade, a major contributor to a doubling of the genetic gain in the Australian national herd. She is a member of International Committee for Animal Recording's Functional Traits as well as Feed and Gas working groups and a member of the scientific committee of the World Congress on Genetics Applied to Livestock Production. Furthermore, her input is valued as the DataGene Lead Scientist, as a member of the Australian Dairy Moving Forward Fertility Group, and the DataGene member of Genetic Evaluation Standing Committee.

Jennie's impact is much broader than publications and dollars for industry. She leads and develops an evergrowing group of scientists and students in Australia and abroad, selflessly providing advice and training. A gifted communicator, Jennie is as at home talking to a group of farmers as she is to scientists or media. She is known for her clear and engaging presentations.

For Jennie's immense contributions to quantitative genetics and breeding, and in particular for her national and global impact on dairy cattle genetics and industry good, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect her as a Fellow of the Association.



Julius van der Werf

Julius van der Werf was born into a dairy farming family in The Netherlands and progressed to a Bachelor of Agricultural Science and Master of Science in 1984, then a PhD in 1990 at Wageningen University. This period included Research Assistantships at Cornell University and the University of Guelph. From 1985 to 1993, Julius was an Assistant Professor at Wageningen University and then a Senior Research Scientist in dairy cattle breeding at the National Institute for Animal Science and Health in The Netherlands from 1993 to 1996.

Julius moved to Australia in 1997 to a senior lecturing position with the University of New England (UNE), Armidale, bringing strong passion and expertise in dairy cattle breeding and soccer. He quickly became a highlight for animal breeding and genetics in Australia, with contributions to fundamental methodology, practical implementation, and training a generation of animal breeders in Australia and overseas. Julius was appointed Associate Professor (in 2001) then Professor in Animal Breeding and Genetics at UNE in 2007.

Julius developed covariance function methods used in dairy cattle, and this has spread widely to other species. With his students he pioneered genetic evaluation and breeding design across purebred and crossbred populations, and many other areas too numerous to list. Most notably for the Australian sheep industries, he has developed methods and designs to best exploit genomic information for speed of genetic gains, and played a key leadership role in having these technologies effectively implemented as a Program Manager in genetics for the Sheep Cooperative Research Centre (CRC) from 2002 to 2019. He has also been on the technical committee for Sheep Genetics since 2005. Julius was also a Program Manager for the CRC for Beef Quality from 2001 to 2006.

Julius has generously shared these and other abilities with many students and colleagues, including the development of educational and decision-aid software made publicly available. He launched and runs the Armidale Animal Breeding Summer Schools series, bringing world-leading experts and international PhD students for about 20 years. This has played a major role in making Australia a destination of choice for students, sabbaticals and settlement.

A long-term supporter of AAABG, Julius was President for the 17th AAABG Conference held in Armidale in 2007, also co-hosting an associated symposium 'Adaptation and Fitness in Animal Populations'. In addition, if you look through the author indexes of AAABG Proceedings, invariably Julius van der Werf's name appears as one of the most prolific authors.

Apart from his long list of significant publications as a senior author or co-author, Julius has made a long-term contribution in editorial roles with scientific journals, with almost 20 years as Co-Editor in Chief of *Genetics, Selection and Evolution* and as an Associate Editor of the *Journal of Animal Breeding and Genetics.* Has was also on the Editorial *Board of Livestock Science* from 2006–2011.

For his outstanding contributions to the science of genetics and animal improvement, the Association for the Advancement of Animal Breeding and Genetics is pleased to elect Julius van der Werf as a fellow of the Association.

## The Helen Newton Turner Medal



## Helen Newton Turner AO OBE

The Helen Newton Turner Medal perpetuates the memory of an outstanding sheep geneticist, and a fine Australian. The award was established in 1993 following an anonymous donation to the Animal Genetics and Breeding Unit (AGBU), a joint venture between the NSW Department of Primary Industries and the University of New England.

The Medal is awarded to provide encouragement and inspiration to those engaged in animal genetics. It is named in honour of Dr Helen Newton Turner whose career with CSIRO was dedicated to research into the genetic improvement of sheep for wool production. Dr Turner's animal breeding research has had a significant impact on animal breeding research and application in Australia and internationally through her participation in overseas research. She was awarded a fellowship of AAABG in 1990 for her services to animal breeding.

The Helen Newton Turner Medallist is chosen by the Trustees of the Helen Newton Turner Trust from the ranks of those persons who have made an outstanding contribution to genetic improvement of Australian livestock. The Helen Newton Turner Medal was first awarded in 1994 to Associate Professor John James and a list of all recipients to date is given below.

The recipient of the Medal is invited to deliver an Oration on a topical subject of their choice.

#### **Helen Newton Turner Medallists**

1994	J.W. James	2001	G.A. Carnaby	2011	R. Banks
1995	L. R. Piper	2003	F. W. Nicholas	2013	M. Goddard
1997	J. Litchfield	2005	K. Hammond	2015	A. R. Gilmour
1998	J. S. F. Barker	2007	L. Corrigan	2017	A. Collins
1999	C. W. Sandilands	2009	R. Hawker	2019	K. D. Atkins

The Oration of the 2019 Medal recipient, Dr Kevin Atkins, is published in this AAABG special issue of *Animal Production Science* (**61**, 1745–1750).

#### The Helen Newton Turner Bright Futures Award

In 2021, the Helen Newton Turner Trust established a new award, the Helen Newton Turner Bright Futures Award to recognise the achievements of an up-and-coming individual who is showing evidence of establishing a reputation for excellence in the field of animal genetics within Australia.