**Personal:**

Nationality Australian

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**Educational Qualifications:**

PhD Mathematical Statistics *The University of Queensland* (1985)

MLitSt Mathematical Statistics *The University of Queensland*

BSc (Hons I) Mathematics *The University of Queensland*

AMusA Piano *Australian Music Examinations Board*

**Fellowships and Accreditations:**

FQA Fellow, *Queensland Academy of Arts and Sciences* (2013)

FTSE Fellow, *Australian Academy of Technological Sciences and Engineering* (2006)

FAICD Fellow, *Australian Institute of Company Directors* (2003)

FAIAST Fellow, *Australian Institute of Agricultural Science and Technology* (1998)

FIS Fellow, *Institute of Statisticians* (merged with *Royal Statistical Society*), UK (1983)

AStat Accredited Statistician, *Statistical Society of Australia* (1998)

CPAg Certified Practising Agriculturist and Leading Professional Stage 3,

*Australian Institute of Agricultural Science and Technology* (1995)

**Awards:**

2010 Life membership, *Statistical Society of Australia Incorporated*

2003 Outstanding Service Award, S*tatistical Society of Australia Incorporated*

1998 Australian Medal for Agricultural, *Australian Institute of Agricultural Science and Technology*

1990, 1994 University of Queensland International Collaborative Research Award to Princeton University

1992 Department of Industry, Technology and Commerce Award in the Bilateral Science and Technology Program to Leiden University, The Netherlands

1988 Faculty of Agricultural Science Golden Lectern Award for Outstanding Lecturing

1986-1987 Fulbright Postdoctoral Fellowship to Cornell University

2000-2003 Associate Editor, *Biometrics*

**Employment History:**

***The University of Queensland***

2012-2014 President, Academic Board

2009-2011 Deputy President, Academic Board

2001-2010 Head, School of Land, Crop and Food Sciences

2000- Professor of Biometry, School of Agriculture and Food Sciences

1988-1999 Senior Lecturer then Associate Professor, Department of Agriculture

***Cornell University***

1986-1987 Statistician, Mathematical Sciences Institute

**Academy and Professional Society Leadership:**

***Australian Academy of Technological Sciences and Engineering***

2014- Chair, International Engagement Strategy Group

2010- Member, Fellowship Assessment Panel

2009-2012 Queensland Representative, National Assembly

2008-2011 Secretary, Queensland Division

***International Biometric Society***

2013-2014 Chair, Nominating Committee

2008-2012 Organising President, IBC2012

2012 Outgoing President

2010-2011 President

2009 President-Elect

2000-2004 Chair, Local Organising Committee for IBC2004

***Statistical Society of Australia Incorporated***

2007-2008 Vice-President

2005-2007 President

2004-2005 Vice-President

2000-2004 Member, Accreditation Committee

1998 Chair, Program Committee for ASC14

***Editorial Boards and Management Committees***

2009-2015 Commissioning Editor/Associate Editor, *Crop and Pasture Science*

2008-2011 Chair, Management Committee, *Australian and New Zealand Journal of Statistics*

2000-2003 Associate Editor, *Biometrics*

**Board Positions:**

***International***

2013- Member, Board of Trustees, *International Rice Research Institute*

(Chair, Audit Committee; Member, Finance Committee)

***National***

2014- Director, *Crawford Fund Limited* (Chair, Queensland Committee)

2013- Director, *Australian Academy of Technological Sciences and Engineering* (Chair, International Engagement Strategy Group)

2012-2014 Member, *UQ Senate* (*ex-officio* as President, Academic Board)

(Member, Finance Committee, Building and Grounds Committee, Legislative Committee)

2002-2015 Director, *Grains Research Foundation Limited*

2002-2008 Member, *UQ Sport Board*

2001-2015 Member and Chair (2001-2006), *Union College Board*

1996-2001 Member, *UQ Senate* (as elected graduate staff member)

(Member, Services and Finance Committee of UQ Students Union)

**Research and Scholarship Activities:**

My **academic focus** has been on the analysis and interpretation of data from large-scale multi-environment plant breeding experiments, such as those conducted by the international agricultural research centers. By using a pattern analysis approach, my specialty, scientists are now able to integrate qualitative, quantitative and molecular data to provide both a global and local summary of the interaction and relationships among genotypes, environments and attributes. This is of major benefit in plant breeding programs.

My first book, McLachlan and Basford (1988), presented the theory and application of the mixture method of clustering, while my second, Basford and Tukey (1999), detailed various graphical approaches to analyzing multiresponse data (as a suitably constructed picture aids enormously in interpreting data). My recent research extends to modelling and bioinformatics (which includes information technology, data management, integration and analysis). I have **published extensively** in the peer-reviewed literature (14 book chapters, of which 6 were invited, and 111 journal articles), produced 5 statistical packages, 11 commissioned reports and 22 technical reports, and given invited presentations at national and international conferences (15 invited presentations from 92 in total). My Web of Science h-index is 20. Most pleasingly, I have supervised or co-supervised 22 PhD and 4 Research Masters **graduates**, with 3 PhD students currently enrolled.

I have a successful track record in attracting **competitive research funds** from government and industry bodies. The most high-profile venture was the Australian Centre for Plant functional Genomics (ACPFG), a joint $45M initiative based in Adelaide, but with nodes in Melbourne and Brisbane. I oversaw the bioinformatics program which had staff at all three places (about 10% of the research effort). The ACPFG was initially funded for 2003-2007 and, after successful reviews, refunded for 2008-2014. I have been responsible for 40% of the $2.2M obtained for the design and analysis of field experimentation, 55% of the $0.5M obtained for cluster analysis and ordination methodology, and 50% of $6.6M obtained for the impact of genotype by environment interactions and modelling of plant breeding programs.

During my career, I have deliberately chosen to work in collaborative teams because I enjoy working with others and consider it to be the most effective way of achieving goals. The success of this strategy was demonstrated in 1998 when I was awarded the highest possible accolade from the Australian Institute of Agricultural Science and Technology – the **Australian Medal for Agriculture**. This award was in recognition of my research and scholarship at the interface between statistics and quantitative genetics and my impact on the design and analysis of large-scale field experiments. This award was especially gratifying because my original training was not in agriculture.

In 2006, I was awarded a **Fellowship with the Australian Academy of Technological Sciences and Engineering** for having developed statistical methods that are used world-wide to improve the efficiency and effectiveness of crop breeding programs. I very much enjoy working with colleagues to determine the best way to extract knowledge.

My professional skills within the broad arena of agriculture and food security are complemented by my experience as an **independent non-executive director** on international, national, and state boards across industry and government sectors. I have substantial expertise in leadership, strategy setting, financial management and corporate governance within the tertiary sector, associated business units and professional entities, with a record of success in implementing revised governance structures and building strong and influential partnerships across education, research and corporate entities. Importantly, I enjoy the challenge of solving real problems, building capacity and achieving industry impact in an environmentally sustainable way.

**Key Publications:**

*Books –*

**Basford, K.E**. and Tukey, J.W. (1999). *Graphical Analysis of Multiresponse Data: Illustrated with a Plant Breeding Trial*. London: Chapman and Hall/CRC Press, 587pp.

McLachlan, G.J. and **Basford, K.E.** (1988). *Mixture Models: Inference and Applications to Clustering*. New York: Marcel Dekker, 253pp.

# Selected Journal Articles –

Arief, VN, DeLacy, IH, Crossa, J, Payne, T, Singh, R., Braun, H-J, Tian, T, **Basford, KE**, Dieters, MJ. (2015). Evaluating Testing Strategies for Plant Breeding Field Trials: Redesigning a CIMMYT International Wheat Nursery. *Crop Science* **55**, 164-177.

**Basford, K.E.** and Harch, B.D. (2014). Statistics critical in securing our food supply. *ATSE Focus* **182**, 10-11.

Arief, V.N., DeLacy, I.N., Wenzl, P., Dreisigacker, S., Crossa, J., Dieters, M.J. and **Basford, K.E.** (2013). Comparing molecular marker combinations in natural or artificial populations. *Journal of Environmental Statistics* **4**, pp. 16 ([www.jenvstat.org](http://www.jenvstat.org)).

**Basford, K.E.,** McLachlan, G.J. and Rathnayake, S.I. (2013). On the classification of microarray gene-expression data. *Briefings in Bioinformatics* **14**, 402-410.

[Hardner, C.M](http://espace.library.uq.edu.au/list/author/Hardner%2C+CM/)., [Dieters, M](http://espace.library.uq.edu.au/list/author/Dieters%2C+M/)., [DeLacy, I](http://espace.library.uq.edu.au/list/author/DeLacy%2C+I/)., [Neal, J](http://espace.library.uq.edu.au/list/author/Neal%2C+J/)., [Fletcher, S](http://espace.library.uq.edu.au/list/author/Fletcher%2C+S/)., [Dale G](http://espace.library.uq.edu.au/list/author/Dale+G/). and [**Basford K.E**](http://espace.library.uq.edu.au/list/author/Basford+KE/)**.** ([2011](http://espace.library.uq.edu.au/list/year/2011/)). [Identifying deployment zones for Eucalyptus camaldulensis E. globulus and E. grandis hybrids using factor analytic modelling of genotype by environment interaction](http://espace.library.uq.edu.au/view/UQ:237127). *Australian Forestry*, **74**, 30-35.

Duran, C., Eales, D., Marshall, D., Imelfort, M., Stiller, J., Berkman, P.J., Clark, T., McKenzie, M., Appleby, N., Batley, J., **Basford, K.** and Edwards, D. (2010). Future tools for association mapping in crop plants. *Genome*  **53**, 1017-1023.

Arief, V.N., Kroonenberg, P.M. DeLacy, I.H., Dieters, M.J., Crossa, J., Dreisigacker, S., Braun, H.-J. and **Basford, K.E.** (2010). Construction and three-way ordination of the wheat phenome atlas. *Journal of Applied Probability and Statistics* **5**, 95-118.

**Basford, K.E.** (2010). Research the key to world food security. *ATSE Focus* **160**, 36-37.

Ellis, R.N., Kroonenberg, P.M., Harch, K.E. and **Basford, K.E.** (2006). Non-linear principal components analysis: an alternative method for finding patterns in environmental data. *Environmetics* **17**, 1-11.

Qiao, C.G., **Basford K.E.**, DeLacy I.H. and Cooper M. (2004). Advantage of single-trial analysis models for response to selection in wheat breeding multi-environment trials. *Theoretical and Applied Genetics* **108**, 1256-1264

**Basford, K.E.**, Federer, W.T. and DeLacy, I.H. (2004). Mixed model formulations for multi-environment trials. *Agronomy Journal* **96**, 143-147.

Hunt, L.A. and **Basford, K.E.** (2001). Fitting a mixture model to three-mode three-way data with missing information. *Journal of Classification* **18**, 209-226.

Qiao, C.G., **Basford, K.E.**, DeLacy, I.H. and Cooper, M. (2000). Evaluation of experimental designs and spatial analyses in the analysis of wheat breeding variety trials. *Theoretical and Applied Genetics*, **100,** 9-16.

Podlich, D.W., Cooper, M. and **Basford, K.E.** (1999). Computer simulation of a selection strategy to accommodate genotype-by-environment interactions in a wheat recurrent selection program. *Plant Breeding* **118**, 17-28.

Harch, B.D., **Basford, K.E.**, DeLacy, I.H. and Lawrence, P.K. (1999). The analysis of large scale data taken from the world groundnut (Arachis hypogaea L.) germplasm collection II. Two-way data with mixed data types. *Euphytica* **105**, 73-82.

**Basford, K.E.** and Cooper, M. (1998). Genotype × environment interactions and some considerations of their implications for wheat breeding in Australia. *Australian Journal of Agricultural Research* **49**, 153-174.