
Curriculum Vitae

Graham Douglas FARQUHAR FAA, FRS

Group Leader, Environmental Biology Group
Associate Director, Research School of Biology
College of Medicine, Biology and Environment
Australian National University

Address: 702 Burra Road
Burra NSW 2620

Date of Birth: 8 December 1947

Academic Qualifications

1968 BSc Australian National University
1969 BSc Queensland Honours in Biophysics
1973 PhD Australian National University
- Supervisors: IR Cowan and RO Slatyer
2006 Doctor Honoris Causa, Universiteit Antwerpen

Academic Awards and Distinctions

1968 Biophysics Scholarship
1970 -73 Commonwealth Post-graduate Scholarship
1980 P.L. Goldacre Award from the Australian Society of Plant Physiologists
1981 Senior Scientist Award under the Japan/Australia Science and Technology Agreement for collaborative research at RIKEN
1982 Australian American Educational Foundation (FULBRIGHT) Senior Scientist Fellowship for research at Carnegie Institution of Washington, Stanford
1983 Gottschalk Medal from the Australian Academy of Science
1984 British Council Academic Links and Interchange Scheme Award
1986 Australia - Royal Society Exchange Award
1987 Bourse de haut niveau du Ministère de la Recherche et de l'Enseignement Supérieur de France
1988 Elected to Fellowship of the Australian Academy of Science
1991 Elected to Corresponding Membership of the American Society of Plant Physiologists
1991 CSIRO Medal for research achievement
1995 Elected to Fellowship of Royal Society (of London)
2001 Leading Australian Citation Laureate
2001 CSIRO Medal for team research
2005 JG Wood Lecturer (Australian Society of Plant Scientists)
2006 Honorary Doctorate, Universiteit Antwerpen

Other Awards and Distinctions

2003 Centenary Medal: Citation '*For service to Australian society and science in plant physiology*'.
2006 Royal Society of Tasmania R.M. Johnston Memorial Medal. Awarded to "a scholar of great distinction in any field within the Society's purview."
2008 Shared Nobel Prize: Inter-governmental Panel on Climate Change

Membership of Learned Societies

- Australian Society of Plant Scientists
- Australian Academy of Science
- American Society of Plant Biologists
- Royal Society of London
- American Geophysical Union

Fields of Interest

- Integration of photosynthesis and growth with nitrogen and water use of plants
- Stomatal physiology
- Isotopic composition of plants
- Global change science

Present Position

Distinguished Professor at The Australian National University (ANU) since 2003

Other Posts

- 1973 - 75 Research Associate, DOE Plant Research Laboratory, MSU
1975 - 76 Research Specialist, DOE Plant Research Laboratory, MSU
1976 - 80 Research Fellow, ANU
1980 Senior Research Fellow, ANU
1980 - 83 Fellow, ANU
1983 - 88 Senior Fellow, ANU
1988 - 2003 Professor, ANU
1988 - 89 Group Leader of Plant Environmental Biology, RSBS, ANU
1998 - 2001 Deputy CEO and Program Leader, CRC for Greenhouse Accounting
1994 - Current Group Leader of Environmental Biology Group, RSBS, ANU
2005 - 2008 Associate Director, Research School of Biological Sciences (RSBS)

Other Activities

The Australian National University

- 1980 - 90 Member, ANU Arts Centre Committee of Management
1994 - 97 Chairman, ANU Global Change Confederation
1998 - 99 Member, Board of the Institute of Advanced Studies, ANU
2001 Member, Steering Committee for the National Institute of Bioscience
2002 - 05 Member, Academic Board, ANU
2002 - 05 Member, National Institute for the Environment
2002 Member, Advisory Board of the ANU Centre for Complex Systems
2003 - 04 Chair, Board of Institute of Advanced Studies [from Sept 2003]
2004 - 05 Chair, Institute of Advanced Studies Forum
2005 Member, Board of the Faculties
2005 Member ANU-CSIRO Alliance Steering Committee and ANU Focus Group for Changing Research Practices
2005 Member, ANU Relationships and Funding Planning Groups
2005 Member, ANU Research Development Working Group
2005 - Current Board Member, Australian National University Institute for Environment
2007 - Current Member, Senior Advisory Board, BioSolar Project
2009 - Current Member, Institute of Advanced Studies sub-committee of the University Research Committee

Australian Academy of Science

- 1990 - 94 Member, Sectional Committee 5,
1993 Member, National Primary School Project Advisory Committee

- 1993 Chairman, Gottschalk Award Committee
1994 - 97 Member, Council
1996 - 97 Chairman, AAS National Committee on Climate and Global Change
1996 - 97 Vice President \
- 2007 – Current Member, Video Histories Committee
2007 – 2010 Member, Theo Murphy Fund Advisory Board
2007 - Current Vice President and Secretary (Biological), member of Executive Committee and of Council

Journal Editorial and Advisory Boards

- 1984 - 89 Member, Advisory Committee for the *Australian Journal of Plant Physiology*
1985 - 93 Member, Editorial Board of *Planta*
1986 - 89 Member, Editorial Advisory Panel of *Tree Physiology*
1986 - Member, Editorial Board of *Functional Ecology* (British Ecological Society)
1987 - Current Member, Review Board of *Plant, Cell and Environment*
1990 - 94 Chairman, Advisory Committee for the *Australian Journal of Plant Physiology*
Member, Board of the Australian Journals of Scientific Research
1993 - 96 Member, Editorial Board, *Plant and Soil*
1993 - 99 Member, Editorial Review Board, *Tree Physiology*
1994 - 98 Member, Editorial Board, *Oecologia*
1997 - 2001 Subject Editor, *Plant, Cell and Environment*
2002 - Editorial Board – *Mitigation and Adaptation Strategies for Global Change*
2005 - Associate Editor, *Plant Cell & Environment*
2005 - Chair, *Functional Plant Biology* Editorial Advisory Committee
2005 - Member Board of Standards for CSIRO/AAS Journals
2008 - Editorial Board - *Ecohydrology*
2008 - Associate Editor – *Water Resources Research*

Other Professional Bodies Activities

- 2003 - 2008 Board Member, Federation of Australian Scientific and Technological Societies
2004 - Board Member, Australian Society of Plant Biologists

Institute/Organisation Reviews and Scientific Advisory Boards

- 1992 Member, INRE Review Committee on CSIRO Division of Atmospheric Research
2002 Reviewer, University of Western Australia's Institute of Advanced Studies
2004 - Current Member, Scientific Advisory Board for the Max-Planck-Institute for Biogeochemistry
2005 - Current Member of Review Panel, Australian Nuclear Science and Technology Organisation (ANSTO) "Isotopic Tracers in Atmospheric Transport" (*IsoTrans*) project
2005 Member Expert Advisory Board of Impacts Centre for Southeast Asia (ICSEA)
2008 Reviewer UK Biotechnology and Biological Research Council (BBSRC) Climate Change Strategic Review of Climate Change Research

Co-founder Cooperative Research Centre for Greenhouse Accounting

- 1998-2000 Deputy CEO and Program Leader,
2001-06 Board alternate
2002-06 Member, Management Team

Government Service

- 1994 - 98 Chairman, National Greenhouse Gases Inventory Working Group on Carbon Dioxide from the Biosphere
1997 Science adviser and Australian delegate to Framework Convention on Climate Change, Conference of Parties, Kyoto
1997 - 2000 Member, Greenhouse Science Advisory Committee
1997 - 1999 Member, Reference Group for Greenhouse Challenge Sinks Workbook
1988 - Member, High Level Steering Committee, National Carbon Accounting System, Australian Greenhouse Office

- 2002 Member, Minister's Consultative Panel on National Research Priorities
2002 Member of Minister's Reference Group on Mapping Australia's Science and Innovation System
2007 - 2008 Member, Climate Change Research Strategy for Primary Industries. Joint Federal, State & Territory governments, CSIRO, Rural Research & Development Corporation; managed by Land & Water Australia

Australian Research Council

- 1990 - 93 Member, Biological Panel, Research Grants Committee
2005 - 2008 Australian Reader

International Committees

- 1983 Australian organiser of US/Australia Science and Technology Agreement Workshop on Stomatal Function
1986 - 93 Elected to International Photosynthesis Committee
1986 - 96 Member, Australian Committee for International Geosphere - Biosphere Programme (IGBP)
1989 - 90 Member, International Coordinating Panel on Biospheric Aspects of the Hydrological Cycle (IGBP)
1990 - 93 Member, Scientific Steering Committee, International Global Atmospheric Chemistry Project (IGAC/IGBP)
1994 - 96 Member, South-East Asian Regional Committee for START
1994 - 96 Chairman, Australian Committee for IGBP.
2006 - 2007 Member, Scientific Advisory Committee for Isotopes 2007 conference, Benicassim, Spain.
2008 - current Member, Scientific Committee for International Botanical Congress, Melbourne 2011
2009 Member, Scientific Steering Committee for the International Carbon Dioxide Conference 2009, Jena, Germany.

Inter-governmental Panel on Climate Change

- 1994 - 96 Lead Author on Second Assessment Report
1994 Member, Australian Academy of Technology Sciences and Engineering Steering Committee on Climate Change
1998 - 2001 Lead Author on Third Assessment Report
1988 - 2000 Convening Lead Author on Special Report on Land Use, Land Use Change and Forestry
2006 - 2007 Reviewer for Fourth Assessment Report
Current Joint IPCC-WCRP-IGBP Working Group: New Science Directions and Activities Relevant to the IPCC AR5

Patents

Masle J, Gilmore SR and Farquhar GD. "The use of the ERECTA gene to control water use efficiency in plants": International Patent Application, number WO 2004/005555 A1 (priority date 02 July 2002).

Publications

275 research publications (see attached bibliography)

Books

- Stomatal Function. 1987. EF Zeiger, GD Farquhar, IR Cowan (eds). Stanford University Press. Stanford, California
- Perspectives of Plant Carbon and Water Relations from Stable Isotopes. 1993. J Ehleringer, AE Hall, GD Farquhar (eds). Academic Press, NY

- Plants in Action: Adaptation in Nature, Performance in Cultivation. 1999. B Atwell, P Kriedemann, C Turnbull (eds). D. Eamus, R. Bielecki (Co-eds.) G. Farquhar (Consulting ed.). Macmillan

Lectures

Invited lectures given at the following International and Australian Symposia

- 2009 Evaporative demand, transpiration, and photosynthesis: How are they changing?
Atmosphere and Climate Colloquium, April 27, IACETH (Institute for Atmospheric and Climate Science, Swiss Federal Institute of Technology), Zurich, Switzerland.
- Evaporative demand, transpiration, and photosynthesis: How are they changing?
EGU (European Geosciences Union) General Assembly, *Land-climate interactions from models and observations: Implications from past to future climate* session, April 19-24, Vienna, Austria.
- 2008 Carbon isotope discrimination, water-use efficiency and water-use effectiveness.
Resource Capture by Crops: Integrated Approaches, September 10-12, University of Nottingham, Sutton Bonington, United Kingdom.
- Carbon Isotope discrimination by leaves.
Joint European Stable Isotopes User Group (JESIUM) August 31 – September 5, Presqu'île de Giens, France.
- Carbon isotope discrimination, water-use efficiency and water-use effectiveness.
International Workshop on Soil-Plant Interactions and Sustainable Agriculture in Arid Environments, July 11-18, Shihezi University, Xinjiang, China
- Pan Evaporation – wind speed.
Miniconference on Relative Humidity, Earth Temperature and Climate Change, June 23-24; Lamont-Doherty Earth Observatory of Columbia University, New York USA
- Opening Address
Uni Sydney Faculty of Agriculture, Food and Natural Resources Symposium *Facing climate change: Research on adaptation of agro-ecosystems*, June 13, University of Sydney.
- CO₂, climate change, and agriculture: it's more or less about water.
Carbon isotope discrimination and plant water-use effectiveness.
Distinguished Ecologist Lecture Series, April 11-15, University of Wyoming, Laramie, US.
- 2007 PenPan: A general tool for the attribution of changing pan evaporation.
AGU Meeting, San Francisco, USA.
- The economics of plant water loss and photosynthetic carbon gain.
Guangzhou, China
- The economics of plant water loss and carbon gain.
- Evaporative demand and the hydrological cycle.
Université Paris Sud XI, Paris, France.
- Implications of climate change for water use by agriculture and natural ecosystems.
Tresury Seminar Series, Canberra.
- Carbon isotope discrimination and water-use effectiveness.
LaTrobe University, Melbourne.
- CO₂ climate change, and agriculture: it's more or less about water.
LaTrobe University, Melbourne.
- Terrestrial carbon sequestration and impacts on global greenhouse gas emissions.
Australian Bureau of Agricultural and Resource Economics (ABARE) Boathouse IV Meeting "Climate Change Impacts: Adaption and Mitigation Policy Responses".
- The evaporation paradox, and the roles of global dimming and stilling.

Comer Science and Education Foundation "Gary C. Comer Abrupt Climate Change Fellowship Conference", New York, US.

Climate change, temperature changes and plant responses.

International Rice Research Institute (IRRI) workshop on "Cool rice for a warmer world", Wuhan, China.

CO₂, climate change, and agriculture: it's more or less about water.

Australian Bureau of Agricultural and Resource Economics (ABARE) Outlook 2007 Conference, Canberra.

Plant physiological responses to environmental forcing - How do stable isotopes behave?

European Science Foundation (ESF) Stable Isotopes in Biospheric-Atmospheric Exchange (SIBAE) Workshop on: "Stable Isotopes in Dendroclimatology - Current Status and Future Prospects." GeoForschungszentrum Potsdam (GFZ), Germany.

2006 Revisiting optimisation theory and transpiration efficiency.

The Biology of Transpiration: From Guard Cells To Globe. American Society of Plant Biologists Conference, Snowbird, Utah, US.

Carbon isotope discrimination by Rubisco and diffusion in leaves: applications to plant water-use efficiency and finding a gene.

The 5th International Conference on Applications of Stable Isotope Techniques to Ecological Studies, Queens University, Belfast, Ireland

Plant water-use efficiency and carbon isotope discrimination

Monash University, Melbourne.

The ACCESS Initiative: Understanding the Future Functioning of Australia's Landscapes.

Australian Academy of Science, Canberra

Carbon isotope discrimination and plant water-use efficiency: ideas, agricultural uptake and now a gene.

Royal Society of Tasmania, Tasmania.

Increasing Atmospheric CO₂ and its Implications

Global Change And The Earth System Symposium on ANU Research, Canberra

Worldwide Changes in Atmospheric Composition and Evaporative Demand and their Effects on Plant Growth and Water Use.

Carbon isotope discrimination and plant water-use efficiency: ideas, agricultural uptake and now a gene.

Peking University, Beijing, China.

Carbon isotope discrimination and plant water-use efficiency.

Universiteit Antwerpen, Belgium.

Plant water-use efficiency and carbon isotope discrimination.

South African Plant Breeders Association 6th Annual Symposium, Langebaan, South Africa.

Climate change and the carbon cycle: Nonlinearities & uncertainties. British Council Workshop International Networking for Young Scientists. Australian National University

2005 Carbon isotope discrimination and water-use effectiveness.

Melbourne University, Melbourne.

Worldwide Changes in Evaporative Demand. Working Group on 'Water and the Environment'. Vatican City.

Evaporative Demand and Climate Change.

- Abrupt Climate Change Fellowship Roundtable 2005. Palisades, New York.
Carbon isotope discrimination and water-use efficiency.
J G Wood Lecture, ComBio2005. Adelaide
- From Pan Evaporation to Pinatubo.
Energy Modelling Forum, Climate Change Impacts and Integrated Assessment Meeting, Snowmass, Colorado, USA
- From the chloroplast via stomata to the atmosphere and back.
Isotopes 2005 Bath. University of Bath, UK.
- Trends in Pan Evaporation, Global Dimming and Brightening: Theory, Observations and Implications for the Terrestrial Water Balance
Carbon Gain and Water use by Plants, and Their Interpretation Using Stable Isotopes Are Estimates of the Terrestrial Water Balance All Wet?
2005 Distinguished Ecologist Lecture Series. Colorado State University, USA
- Trends in Pan Evaporation, Global Dimming and Brightening: Theory, Observations and Implications for the Terrestrial Water Balance
Institute for Multi-disciplinary Earth Studies, National Centre for Atmospheric Research. Boulder, USA
- Drier or Wetter Under Climate Change?
Science Meets Parliament Forum "Climate Change: what is the scientific consensus?", Canberra, ACT.
- 2004 The pan evaporation paradox – an overview of the scope of the problem. Australian Academy of Science Pan Evaporation Workshop. Canberra, ACT
- Trends in Pan Evaporation: Theory, Observations and Implications for the Terrestrial Water Balance.
16th Australian and New Zealand Climate Forum, Lorne, Victoria
- Modelling leaf water enrichment.
Biosphere-Atmosphere Stable Isotope Network (BASIN) and Stable Isotopes in Biospheric-Atmospheric Exchange (SIBAE) "Oxygen isotopes as a tracer linking global O₂, CO₂, and H₂O cycles" joint meeting. Marshall, USA.
- Carbon Gain and Water Use by Plants.
Gordon Research Conference, The Metabolic Basis of Ecology, Maine, USA
- Pan Evaporation in the Southern Hemisphere: What is Happening?
AGU-CGU Union Joint Assembly, Magnitudes and causes of declining solar radiation at the surface: Montreal, Canada
- Oxygen isotopes in leaf water, and CO₂ – remember the gross fluxes.
Stable Isotopes in Biospheric-Atmospheric Exchange (SIBAE) and Biosphere-Atmosphere Stable Isotope Network (BASIN) joint conference. Interlaken, Switzerland.
- Entropy production during plant gas exchange.
Maximum Entropy Production Workshop: INRA Bordeaux-Aquitaine, France
- 2003 Oxygen isotope enrichment of leaf water and organic matter
SIBAE BASIN Workshop: Orvieto, Italy
- Why is pan evaporation rate going down in the northern hemisphere if there is global

warming?

The Climate Centre Fall 2003 Lecturer : Columbia University, USA LDEO Campus

Pan evaporation rate in the southern hemisphere: implications for greenhouse vs aerosols.

The Climate Centre Fall 2003 Lecturer: Columbia University, USA NASA/GISS Campus

Oxygen isotopes in leaf organic material.

NETCARB Third Summer School: Germany.

The cause of decreased pan evaporation over the past 50 years.

EGS-AGU-EU6 Joint Assembly: Nice, France.

The cause of decreased pan evaporation over the past 50 years

MEP Workshop: Bordeaux, France

Incorporating the effects of diffuse light in simple models of photosynthesis and evaporation: implications for a canopy and the globe.

Monsi & Saeki Symposium: Kyoto, Japan

2002 Processes affecting the ^{18}O composition of leaf water. Stable Isotopes and Biosphere-Atmosphere Interactions. Banff, Canada

On the spatial variation of the isotopic composition of leaf water. Stable isotope Techniques for the Analysis of Plant Metabolism, Nantes, France

2001 Unanswered questions about stomatal functioning. Forests at the Land-Atmosphere Interface, Edinburgh

Biological questions on the Dole effect. Fourth International Symposium on Inorganic Carbon Utilization, Cairns

Role of terrestrial sequestration in meeting Kyoto targets. Australian Petroleum Production and Exploration Association Ltd Conference, Hobart

Honouring research in Australia: A Scientists Perspective. ISI Honouring Research in Australia, Canberra

Applications of stable isotopes in palaeoecology. Spring Meeting American Geophysical Union, Boston

Forests, Forest Industry and Greenhouse Effect. 14th Convocation of the International Council of Academics of Engineering and Technological Sciences – World Forests and Technology, Finland

2000 Forest, forest industry and greenhouse effect. Fourteenth CAETS Convocation, World Forests and Technology, Espoo, Finland

Transpiration efficiency and carbon isotope discrimination. Water and Plants in the Landscape, CSIRO, Canberra

1999 Carbon dynamics: a major driver of global change. The Global Change Transects Workshop, Darwin

Oxygen isotope composition of organic matter. International Conference on Stable Isotopes and Isotope Effects, Carry le Rouet, France

- Oxygen isotope composition of organic matter. Fifth European Symposium on Food Authenticity, La Baule, France
- Global change: a plant perspective using carbon and oxygen isotope ratios. Australian and New Zealand Society for Mass Spectrometry Conference, Thredbo
- Global change: a plant perspective using carbon and oxygen isotope ratios. Stable Isotope Techniques Workshop, University of Western Australia, Perth
- 1998 Kyoto – The Impact on Australia, APEC Centre, Melbourne
- Where could Australia's forests move with change in atmospheric composition: some ideas from plant physiology and the paleo-record. CSIRO and Bureau of Resource Science, Canberra
- Global change: a plant perspective. Yale University, Connecticut, USA
- Australian Quaternary Palaeoecology and Palaeoclimatology Workshop, Academy of Science, Canberra
- National Association of Forest Industries (NAFI), presentation at Greenhouse Stakeholders meeting, Canberra
- 1997 What are Stomates For? Journal of Experimental Botany Symposium, University of Kent, Canterbury, UK
- Vegetation-Climate-Atmospheric Interactions: Past, Present and Future. Royal Society Symposium, London, UK
- 1996 Design of a Carbon Cycle Observing System, Boulder, Colorado, USA
- Stable Isotopes and the Integration of Biological, Ecological and Geochemical Processes Conference, Newcastle, UK
- NCAR Summer Colloquium, Terrestrial Ecosystems and the Atmosphere, Boulder, Colorado, USA
- 1995 Global Change: a plant perspective, IGBP/ICSU Forum on Earth System Research, Beijing, China
- Plant response to CO₂: Is plant growth being stimulated by increasing atmospheric CO₂? US National Academy of Sciences, Colloquium on Carbon Dioxide and Climate Change, Irvine, California, USA
- 1994 Signals from plants seen in atmospheric CO₂ and its isotopes, 5th Australian Environmental Isotopes Conference, Brisbane
- Biosphere 2 - a plant perspective, Space Biosphere Ventures, Oracle, Arizona, USA
- The global carbon budget, Greenhouse '94, Wellington, New Zealand
- 1993 Ecophysiology and Genetics of Trees and Forests in a Changing Environment, Viterbo, Italy
- Genetic and environmental effects on carbon and oxygen isotope discrimination during CO₂ assimilation, International Botanical Congress, Yokohama, Japan
- Optimisation of stomatal behaviour and water-use efficiency at elevated CO₂ concentration and temperature, International Botanical Congress, Yokohama
- ¹⁸O effects during CO₂ assimilation, International CO₂ Conference, Carqueiranne, France
- 1992 International Symposium on Perspectives of Plant Carbon and Water Relations from Stable Isotopes, Riverside, California, USA
- Photosynthetic Responses to the Environment, Kona, Hawaii

- IPCC meeting on Biotic Feedbacks in the Global Carbon Cycle, Wood's Hole, Massachusetts, USA
- 1991 International Global Atmospheric Chemistry, San Jose dos Campos, Brazil
International Symposium: Physiology and Determination of Crop Yield, Gainesville, Florida, USA
- 1990 Degradation of Vegetation in Semi-Arid Regions: Climate Impact and Implications, Sydney
Mathematical and Statistical Modelling of Global Change Processes, Canberra
Water and Life: Comparative Analysis of Water Relationships at the organismic, Cellular and Molecular Levels, Crans- sur-Sierre, Switzerland
Trends in Photosynthetic Research, Palma de Mallorca, Spain
FAO/IAEA International Symposium on the Use of Stable Isotopes in Plant Nutrition, Soil Fertility and Environmental Studies, Vienna, Austria
Scaling Processes between Leaf and Landscape Levels, Snowbird, Utah, USA
- 1989 International Geosphere-Biosphere Workshop: Global Change - A Plant Perspective, Brisbane
Symposium on Perspectives in Biochemical and Genetic Regulation of Photosynthesis, New Haven, USA
Symposium on Stomatal Resistance, University Park, Pa, USA
Rockefeller Foundation Meeting on the Potentials of Biotechnology for Improving Grain Yield of Rice under Water Limited Conditions, Bellagio, Italy
- 1988 International Geosphere-Biosphere Programme on Global Change, Canberra
Society for Experimental Biology, Symposium on Plants under Stress, Lancaster, UK
Royal Society meeting on Measurement of Photosynthesis, London, UK
Photosynthesis Symposium, Stanford, USA
US-Australia Workshop on Remote Sensing of Biosphere Functioning, Honolulu, USA
- 1987 6th Annual Plant Biochemistry and Physiology Symposium, Columbia, Missouri, USA
Rubisco 87, Tucson, USA
Vth International Conference on Mediterranean-Climate Ecosystems, Montpellier, France
XIV International Botanical Congress, Berlin, West Germany
Society for Experimental Biology Meeting on Plants and Temperature, Colchester, UK
Second German-French Colloquium on advances in research and use of stable isotopes, Maria Laach, West Germany
NATO Advanced Research Workshop, Forest Biomass for Fiber and Energy, Obidos, Portugal
International Symposium on Improving Winter Cereals Affected by Temperature and Salinity Stresses, Cordoba, Spain
- 1986 NASA Conference on Climate-Vegetation Interactions, Goddard Space
Applications of Stable Isotope Ratios to Ecological Research, UCLA Lake Arrowhead Conference Center, USA
-

- VII International Congress on Photosynthesis, Brown University, Providence, RI, USA
- 1985 The Changing Earth: an Australian Perspective, Canberra
Regulation of CO₂ assimilation, Gordon Conference on CO₂ fixation by green plants, New Hampshire, USA
BP Venture Research Conference, London, UK
- 1984 British Plant Growth Regulator Group Meeting, York, UK
Conference on Coasts and Tidal Wetlands of the Australian Monsoon Region, Darwin
- 1983 Gordon Conference on the Chemistry and Physics of Isotopes, Santa Barbara, California, USA
US-Australia Workshop on Stomatal Function, Honolulu, USA
International Congress on Photosynthesis, Brussels, Belgium
Symposium on the Kinetics of C₃ Photosynthesis, Tallinn, Estonia, USSR
- 1982 AAAS Conference on Plant Responses to Rising CO₂ concentration, Athens, Ga, USA
Ewing Symposium. Climate Processes: Sensitivity to Solar Irradiance and CO₂, New York, USA

PhD Students supervised [with graduation date]

- 1979 SC Wong
1981 MC Ball
1981 S von Caemmerer
1981 G Constable
1984 SF Ledgard
1984 JR Evans
1986 A Brooks
1986 MUF Kirschbaum
1988 AG Condon
1990 D Bagnall
1992 S Henderson
1992 J Virgona
1992 C López-Castañeda
1993 H Gomez-Macpherson
1996 D de Pury
1996 G Beemster
1996 A van Herwaarden
1997 PJ Franks
1998 M Barbour
2001 J Yong
2001 M Böhm
2002 T June
2003 J Styles
K Gan
J Miller
I Tremmel
2004 L Cernusak
2005 Y Zhou
2006 S. Gilmore [co-supervisor with Dr J. Masle]
2007 X. Sirault

Bibliography*Most significant publications (shown in blue)*

- 275 Bernacchi CJ, Rosenthal DM, Pimentel C, Long SP, and Farquhar GD. Modeling the Temperature Dependence of C₃ Photosynthesis. *In* Photosynthesis in silico: Understanding Complexity from Molecules to Ecosystems. A Laisk, L Nedbal and Govindjee (eds). Springer-Netherlands. Volume 29, pp 231-246.
- 274 von Caemmerer S, Farquhar G and Berry J. (2009) Biochemical Model of C₃ Photosynthesis. *In* Photosynthesis in silico: Understanding Complexity from Molecules to Ecosystems. A Laisk, L Nedbal and Govindjee (eds). Springer-Netherlands. Volume 29, pp 209-230.
- 273 Cernusak LA, Tcherkez G, Keitel C, Cornwell WK, Santiago LS, Knohl A, Barbour MM, Williams DG, Reich, Ellsworth DS, Dawson TE, Griffiths HG, Farquhar GD, Wright IJ, and Westoby M (2009) Why are non-photosynthetic tissues generally ¹³C enriched compared to leaves in C₃ plants? Review and synthesis of current hypotheses. *Functional Plant Biology* 36: 199-2131.
- 272 Roderick ML, Hobbins MT Farquhar GD (2009). Pan Evaporation Trends and the Terrestrial Water Balance. II. Energy Balance and Interpretation **Geography Compass** 3: 761 – 780 10.1111/j.1749-8198.2008.00214.x
- 271 Roderick ML, Hobbins MT Farquhar GD (2009). Pan Evaporation Trends and the Terrestrial Water Balance. I. Principles and Observations **Geography Compass** 3: 746-760 doi: 10.1111/j.1749-8198.2008.00213.x
- 270 Still CJ, Riley WJ, Biraud SC, Noone DC, Buening NH, Randerson JT, Torn MS, Welker J, White JWC, Vachon R, Farquhar GD, and Berry JA. (2009) The influence of clouds and diffuse radiation on ecosystem-atmosphere CO₂ and CO¹⁸O exchanges. **Journal of Geophysical Research – Biogeosciences** 114, G01018 doi:10.1029/2008JG000675
- 269 Harrison MT, Edwards EJ, Farquhar GD, Nicotra AB and Evans JR. (2009) Nitrogen in cell walls of sclerophyllous leaves accounts for little of the variation in photosynthetic nitrogen use efficiency. **Plant Cell and Environment** 32 (3): 259-271 10.1111/j.1365-3040.2008.01918.x
- 268 Gessler A, Tcherkez G, Karyanto O, Keitel C, Ferrio JP, Ghashghaie J, Kreuzwieser J, Farquhar GD On the metabolic origin of the carbon isotope composition of CO₂ evolved from darkened light-adapted leaves in *Ricinus communis*. **New Phytologist** 181, 374-386 doi: 10.1111/j.1469-8137.2008.02672x.
- 267 Ainsworth EA, Beier C, Calfapietra C, Ceulemans R, Durand-Tardif M, Farquhar GD, Godbold DL, Hendry TH, Kaduk J, Karnosky DF, Kimball BA, Körner C, Koorneef M, Lafarge T, Leakey ADB, Lewin KF, Long SP, Manderscheid R, McNeil DL, Mies TA, Miglietta F, Morgan JA, Nagy J, Norby RJ, Norton RM, Percy KE, Rogers A, Soussana J-F, Stitt M, Weigel H-J and White JW. (2008) Next generation of elevated [CO₂] experiments with crops: A critical investment for feeding the future world. **Plant Cell and Environment** 31, 1317-1324.
- 266 Grice K, Lu H, Zhou Y, Stuart-Williams H, Farquhar GD (2008) Biosynthetic and environmental effects on the stable carbon isotopic compositions of anteiso- (3-methyl) and iso- (2-methyl) alkanes in tobacco leaves **Phytochemistry** (in press).
- 265 Hobbins MT, Dai A, Roderick ML, and Farquhar GD (2008). Revisiting the parameterization of potential evaporation as a driver of long-term water balance trends. **Geophysical Research Letters** 35, L12403, doi:10.1029/2008GL033840
- 264 Gessler A, Tcherkez G, Peuke AD, Ghashghaie J, Farquhar GD (2008). Experimental

- evidence for diel variations of the carbon isotope composition in leaf, stem and phloem sap organic matter in *Ricinus communis*. **Plant, Cell and Environment** 31, 941- 953doi: 10.1111/j.1365-3040.2008.01806.x
- 263 Tcherkez G and Farquhar GD (2008). On the effect of heavy water (D₂O) on carbon isotope fractionation in photosynthesis **Functional Plant Biology** 35, 201-212
- 262 Stuart-Williams H, Wong S C, Farquhar GD, Keitel C and Clayton S (2008) An innovative molybdenum column liner for oxygen and hydrogen stable isotope analysis by pyrolysis. **Rapid Communications in Mass Spectrometry** 22, 1117-1126 doi: 10.1002/rcm.3474
- 261 Lloyd J and Farquhar GD. (2008). Effects of rising temperatures and [CO₂] on the physiology of tropical forest trees. **Phil. Trans. R. Soc. B** doi:10.1098/rstb.2007.0032
- 260 Ripullone F, Matsuo N, Stuart-Williams H, Wong SC, Borghetti M, Tani M and Farquhar GD (2008) Environmental effects on oxygen isotope enrichment of leaf water in cotton leaves. **Plant Physiology**, 146: 729-736 PLANTPHYSIOL/2007/105643 DOI:10.1104/pp.107.105643
- 259 G.J. Rebetzke, A.G. Condon, G.D. Farquhar, R. Appels, and R.A. Richards (2007) Quantitative trait loci for carbon isotope discrimination are repeatable across environments and wheat mapping populations. **Theoretical and Applied Genetics** (in press)
- 258 McNevin et al. (2007) Differences in carbon isotope discrimination of three variant Rubiscos* reflect differences in their catalytic mechanism. **J Biol Chem Vol** 282, 49 36068-36076.
- 257 Tcherkez G and Farquhar GD. (2007) On the ¹⁶O/¹⁸O isotope effect associated with photosynthetic O₂ production. **Functional Plant Biology** 34, 1049–1052
- 256 Condon AG, Reynolds MP, Rebetzke GJ, Van Ginkel M, Richards RR and Farquhar GD. (2007) Using stomatal aperture-related traits to select for high yield potential in bread wheat. *In* Developments in Plant Breeding 11 - Wheat Production in Stressed Environments. HT Buck, JE Nisi and N Salomón (eds). Springer Netherlands. Volume 12, pp 617-624.
- 255 Roderick ML, Rotstayn LD, Farquhar GD and Hobbins MT. (2007) On the attribution of changing pan evaporation. **Geophysical Research Letters** VOL. 34, L17403, doi:10.1029/2007GL031166
- 254 Sharkey TD, Bernacchi CJ, Farquhar GD and Singaas EL (2007) Fitting photosynthetic carbon dioxide response curves for C₃ leaves. **Plant, Cell and Environment** 30, 1035-1040. doi: 10.1111/j.1365-3040.2007.01710.x
- 253 Paltridge GW, Farquhar GD and Cuntz M. (2007) Maximum entropy production, cloud feedback and climate change. **Geophysical Research Letters** 34, L14708, doi:10.1029/2007GL029925.
- 252 Cuntz M, Ogée J, Farquhar GD, Peylin P and Cernusak LA (2007) Modelling advection and diffusion of water isotopologues in leaves. **Plant, Cell and Environment** 30, 892-909.
- 251 Gessler A, Keitel C, Kodama N, Weston C, Winters AJ, Keith H, Grice K, Leuning R, Farquhar GD $\delta^{13}\text{C}$ of organic matter transported from the leaves to the roots in *Eucalyptus delegatensis* - short-term variations and relation to respired CO₂. **Functional Plant Biology** 34, 692-706.
- 250 I. G. Tremmel , E. Weis , and G. D. Farquhar (2007) Macromolecular crowding and its influence on possible reaction mechanisms in photosynthetic electron flow **Biochimica et Biophysica Acta** 1767, 353-361.

- 249 Krull E, Bray S, Harms B, Baxter N, Bol R, Farquhar G (2007) Development of a stable isotope index to assess decadal-scale vegetation change and application to woodlands of the Burdekin catchment, Australia. **Global Change Biology** 13, 1-14.
- 248 Stork NE, Balston J, Farquhar GD, Franks PJ, Holtum JAM and Liddell MJ (2007) Commentary. Tropical rainforest canopies and climate change **Austral Ecology** 32, 80–86
- 247 Beer C, Reichstein M, Ciais P, Farquhar GD, and Papale D (2007) Mean annual GPP of Europe derived from its water balance. **Geophysical Research Letters** VOL. 34, L05401, doi:10.1029/2006GL029006
- 246 Thompson AJ, Andrews J, Mulholland BJ, McKee JMT, Hilton HW, Horridge JS, Farquhar GD, Smeeton RC, Smillie IRA, Black CR and Taylor IB (2007) Overproduction of abscisic acid in *Solanum lycopersicum* l. increases transpiration efficiency and root hydraulic conductivity and influences leaf expansion. **Plant Physiology** 143, 1905-1917.
- 245 Farquhar GD and Roderick ML (2007) Worldwide Changes in Evaporative Demand. *In* The Proceedings of the Working Group 12-14 November 2005 "Water and the Environment", Pontificia Academia Scientiarvm 108. Prof I Rodriguez-Iturbe and H.E. Msgr. MS Sorondo (eds). Pontificia Academia Scientiarvm. pp81-103
- 244 Gessler A, Peuke AD, Keitel C, Farquhar GD (2007) Oxygen isotope enrichment of organic matter in *Ricinus communis* during the diel course and as affected by assimilate transport. **New Phytologist** doi: 10.1111/j.14698137.2007.02007.x.
- 243 Lloyd J, Bird MI, Vellen L, Miranda AC, Veenendaal EM, Djagbletey G, Miranda HS, Cook G, Farquhar GD (2007) Contributions of woody and herbaceous vegetation to tropical savanna ecosystem productivity: A quasi-global estimate. **Tree Physiology** 28: 451-468.
- 242 Barbour MM, Farquhar GD, Hanson DT, Bickford CP, Powers H, McDowell NG (2007). A new measurement technique reveals temporal variation in $\delta^{18}\text{O}$ of leaf-respired CO_2 . **Plant, Cell and Environment** 30, 456-468.
- 241 Farquhar GD, Cernusak LA, Barnes B (2007) Heavy water fractionation during transpiration. **Plant Physiology** 143, 11–18.
- 240 Franks PJ and Farquhar GD (2007) The mechanical diversity of stomata and its significance in gas exchange control. **Plant Physiology** 143, 77-87.
- 239 Rotstayn LD, Cai W, Dix MR, Farquhar GD, Feng Y, Ginoux P, Herzog M, Ito A, Penner JE, Roderick ML, and Wang M (2006) Have Australian Rainfall and Cloudiness Increased Due to the Remote Effects of Asian Anthropogenic Aerosols? **Journal of Geophysical Research - Atmospheres**. Vol. 112 doi:10.1029/2006JD007712
- 238 McNevin DB, Badger MMR, Kane HJ, and Farquhar GD (2006). Measurement of (carbon) kinetic isotope effect by Rayleigh fractionation using membrane inlet mass spectrometry for CO_2 consuming reactions. **Functional Plant Biology** 33, 1115–1128
- 237 Marengo RA, Siebke K, Farquhar GD, Ball MC (2006) Hydraulically based stomatal oscillations and stomatal patchiness in *Gossypium hirsutum*. **Functional Plant Biology** 33, 1103–1113.
- 236 McNevin DB, von Caemmerer S and Farquhar GD (2006). Determining RuBisCO activation kinetics and other rate and equilibrium constants by simultaneous multiple non-linear regression of a kinetic model. **Journal of Experimental Botany** 27 (14): 3883-3900

- 235 Rotstayn LD, Roderick ML and Farquhar GD (2006). A simple pan-evaporation model for analysis of climate simulations: Evaluation over Australia. **Geophysical Research Letters** 33: L17715, doi: 10.1029/2006GL027114
- 234 Kirschbaum MUF, Bruhn D, Etheridge DM, Evans JR, Farquhar GD, Gifford RM, Paul KI and Winters AJ (2006). A comment on the quantitative significance of aerobic methane released by plants. **Functional Plant Biology** 33: 521-530
- 233 Tcherkez G, Farquhar GD and Andrews TJ (2006). Despite slow catalysis and confused substrate specificity, all ribulose biphosphate carboxylases may be nearly perfectly optimized. **Proceedings of the National Academy of Sciences of the USA** 103 (15) 7246-7251
- see also Commentaries in PNAS and Nature:*
- Gutteridge S and Pierce J (2006) A unified theory for the basis of the limitations of the primary reaction of photosynthetic CO₂ fixation: Was Dr. Pangloss right? *Proceedings of the National Academy of Sciences of the USA* 103 (19) 7203-7204
- Griffiths, H (2006) Designs on Rubisco. *Nature* 441 940-941
- 232 Tcherkez G and Farquhar GD (2006). Isotopic fractionation by plant nitrate reductase, twenty years later. **Functional Plant Biology** 33: 531-537
- 231 Rebetzke GJ, Richards RA, Condon AG and Farquhar GD (2006) Inheritance of carbon isotope discrimination in bread wheat (*Triticum aestivum* L.) **Euphytica** 150: 97-106 doi: 10.1007/S10681-006-9097-4
- 230 Barbour MM, Cernusak LA, Whitehead D, Griffin KL, Turnbull MH, Tissue DT and Farquhar GD (2005). Nocturnal stomatal conductance and implications for modeling $\delta^{13}\text{C}$ of leaf-respired CO₂ in temperate tree species. **Functional Plant Biology** 32: 1107-1121
- 229 Powles JE, Buckley TN, Nicotra AB and Farquhar GD (2006). Dynamics of stomatal water relations following leaf excision. **Plant, Cell and Environment** 29: 981-992
- 228 Roderick, ML and Farquhar GD (2005) Changes in New Zealand Pan Evaporation since the 1970s. **International Journal of Climatology** 25: 2031-2039.
- 227 Berry, S.L., Farquhar, G. D. and Roderick, M. L. (2005) Co-evolution of climate, vegetation, soil and air. In: *Encyclopedia of Hydrological Sciences Vol 1*: 177-192
- 226 Condon AG, Farquhar GD, Rebetzke GJ, Richards RA (2006) The application of carbon isotope discrimination in cereal improvement for water-limited environments. In *Drought Tolerance in Cereals*. Ed J-M Ribaut. Haworth Press, Binghamton NY DOI: 10.1300/5781.06 Chap 6 pp 171-219
- 225 Masle J, Gilmore SR and Farquhar GD (2005) The ERECTA gene regulates plant transpiration efficiency in Arabidopsis. **Nature** 436, 866-870 doi: 10.1038/nature03835
- 224 Tcherkez G and Farquhar GD (2005) Carbon isotope effect predictions for enzymes involved in the primary carbon metabolism of plant leaves. **Functional Plant Biology** 32 (4) 277-291
- 223 Farquhar GD and Cernusak LA (2005) On the isotopic composition of leaf water in the non-steady state. **Functional Plant Biology** 32 (4) 293-303
- 222 Tremmel IG, Weiss E and Farquhar GD (2005) The influence of protein-protein interactions on the organisation of proteins within thylakoid membranes. **Biophysical Journal** 88, 2650–2660.

- 221 Condon AG, Richards RA, Rebetzke GJ and Farquhar GD (2004) Breeding for high water-use efficiency. **Journal of Experimental Biology** 55 (407) 2247-2459
- 220 Guehl J-M, Bonal D, Ferhi A, Barigah TS, Farquhar GD, Granier A (2004) Community-level diversity of carbon-water relations in rainforest trees. *In Ecology and Management of a Neotropical Rainforest (Lessons drawn for Paracou, a long-term experimental research site in French Guiana)*. S Gourlet-Fleury, J-M Guehl and O Laroussinie (eds). Elsevier SAS. Chapter 2, pp 75–94.
- 219 Cernusak LA, Farquhar GD, Pate JS (2004) Environmental and physiological controls over oxygen and carbon isotope composition of Tasmanian blue gum, *Eucalyptus globulus*. **Tree Physiology** 25 129-146
- 218 Barbour MM, Hunt JE, Dungan RJ, Turnbull MH, Brailsford GW, Farquhar GD, Whitehead D (2004) Variation in the degree of coupling between $\delta^{13}\text{C}$ of phloem sap and ecosystem respiration in two mature *Nothofagus* forests. **New Phytologist** 497-512
- 217 Tcherkez G, Farquhar GD, Badeck F and Ghashghaie J (2004) Theoretical considerations about carbon isotope distribution in glucose of C_3 plants. **Functional Plant Biology** 31: 857-877.
- 216 Buckley TN and Farquhar GD (2004) A new analytical model for whole-leaf potential electron transport rate. **Plant, Cell and Environment** 27:12 1487-1502
- 215 Cernusak LA, Farquhar GD, Wong SC and Stuart-Williams HLeQ (2004) Measurement and interpretation of the oxygen isotope composition of carbon dioxide respired by leaves in the dark. **Plant Physiology** 136: 3350–3363.
- 214 Roderick ML and Farquhar GD (2004) Changes in Australian Pan Evaporation from 1970 to 2002. **International Journal of Climatology** 24(9) 1077-1090.
- 213 June T, Evans JR and Farquhar GD (2004) A simple new equation for the reversible temperature dependence of photosynthetic electron transport: a study on soybean leaf. **Functional Plant Biology** 31, 275-83.
- 212 Cernusak LA, Pate JS, Farquhar GD (2004) Oxygen and carbon isotope composition of parasitic plants and their hosts in southwestern Australia. **Oecologia** 27 (1) 107-121
- 211 Barnes B, Farquhar GD and Gan KS (2004) Modelling the isotope enrichment of leaf water, **Journal of Mathematical Biology**. 48: 672-702 .
- 210 Barbour MM and Farquhar GD (2003) Do pathways of water movement and leaf anatomical dimensions allow development of gradients in H_2^{18}O between veins and the sites of evaporation within leaves? **Plant, Cell & Environment** 27 (1) 107-121.
- 209 Barbour MM, Roden JS, Farquhar GD, and Ehleringer JR (2003) Expressing leaf water and cellulose oxygen isotope ratios as enrichment above source water reveals evidence of a Péclet effect. **Oecologia** 138: 426-435.
- 208 Tremmel IG, Kirchhoff H, Weis E, and Farquhar GD (2003) Dependence of plastoquinol diffusion on the shape, size, and density of integral thylakoid proteins. **Biochimica et Biophysica Acta** 1607:97-109.
- 207 Cernusak LA, Wong SC, and Farquhar GD (2003) Oxygen isotope composition of phloem sap in relation to leaf water in *Ricinus communis*. **Functional Plant Biology** 30: 1059-1070.
- 206 Roderick ML, Farquhar GD (2003) The pan evaporation paradox. In: Steffen W, Sanderson A, Tyson P, Jäger J, Matson P, Moore III B, Oldfield F, Richardson K, Schellnhuber H-J, Turner II BL, Wasson R (eds) *Global Change and the Earth System: A Planet Under Pressure*. **IGBP Global Change Series**. Springer-

- Verlag, Berlin Heidelberg New York, p 167.
- 205 Gan KS, Wong SC, Hong JW and Farquhar GD. (2003). Evaluation of models of leaf water ^{18}O enrichment using measurements of spatial patterns of vein xylem, leaf water and dry matter in maize leaves **Plant, Cell & Environment** 26 (9): 1479-1495.
- 204 Farquhar GD and Roderick ML (2003). Pinatubo, diffuse light, and the carbon cycle. **Science** 299: 5615.
- 203 Buckley TN, Mott KA, and Farquhar GD. (2003). A hydromechanical and biochemical model of stomatal conductance. **Plant, Cell & Environment** 26: 1767-1785.
- 202 Cernusak LA, Arthur DJ, Pate JA, Farquhar GD (2003). Water relations link carbon and oxygen isotope discrimination to phloem sap sugar concentration in *Eucalyptus globulus*. **Plant Physiology** 131: 1544-1554.
- 201 Rebetzke GJ, Condon AG, Richards RA and Farquhar GD (2003) Inheritance of leaf conductance in three wheat crosses. **Aust J Agric Res** 54: 381-387.
- 200 Farquhar GD and Gan KS (2003) On the progressive enrichment of the oxygen isotopic composition of water along a leaf. **Plant, Cell & Environment** 26(6): 801-819.
- 199 [Roderick ML and Farquhar GD \(2002\) The cause of decreased pan evaporation over the last 50 years. **Science** 298: 1410-1411.](#)
- 198 Barbour MM, Cernusak LA, Farquhar GD (2004) Factors affecting the oxygen isotope ratio of plant organic material. In LB Flanagan, JR Ehleringer and DE Pataki eds. *Stable Isotopes and Biosphere Atmosphere Interactions* Elsevier Academic Press. Chapter 2, pp 9-28
- 197 Styles JM, Raupach MR, Farquhar GD, Kolle O, Lawton KA, Brand WA, Werner RA, Jordan A, Schulze E-D, Shibistova O and Lloyd J (2002), Soil and canopy CO_2 , $^{13}\text{CO}_2$, H_2O and sensible heat flux partitions in a forest canopy inferred from concentration measurements. **Tellus B** 54 (5): 655-676
- 196 Gan KS, Wong SC, Yong JW H, Farquhar GD (2002). ^{18}O Spatial patterns of vein xylem water, leaf water and dry matter in cotton leaves. **Plant Physiology** 130: 1008-1021
- 195 Barbour MM, Walcroft AS, Farquhar GD (2002). Seasonal variation in $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ of cellulose from growth rings of *Pinus radiata*. **Plant, Cell and Environment** 25 (11): 1483-1499
- 194 Mäkelä A, Givnish TJ., Berninger F, Buckley TN, Farquhar GD, Hari P (2002). Challenges and opportunities of the optimality approach in plant ecology. **Silva Fennica** 36(3):605-614
- 193 Buckley TN, Farquhar GD, Miller JM (2002) The mathematics of linked optimisation for water and nitrogen use in a canopy. **Silva Fennica** 36(3):639-669
- 192 Farquhar GD, Buckley TN, Miller JM (2002) Optimal stomatal control in relation to leaf area and nitrogen content. **Silva Fennica** 36(3):625-637
- 191 Cernusak, LA, Pate, JA, Farquhar, GD, (2002). Diurnal variation in the stable isotope composition of water and dry matter in fruiting *Lupinus angustifolius* under field conditions. **Plant, Cell and Environment** 25: 893-907
- 190 Prasolova, NV, Xu, ZH, Lundkvist, K, Farquhar, GD, Dieters, MJ, Walker, S, and Saffigna, PG (2003) Genetic variation in foliar carbon isotope composition in relation to tree growth and foliar nitrogen concentrations in clones of F_1 hybrid between slash pine and Caribbean pine. **Forest Ecology and Management** 172 (2-3): 145-160

- 189 Gan KS, Wong SC and Farquhar GD (2004). Oxygen isotope analysis of plant water without extraction procedure. *In Handbook of Stable Isotope Analytical Techniques*, Volume I (ed Pier A. de Groot), Elsevier.
- 188 Condon, AG, Richards, RA, Rebetzke, GJ, and Farquhar, GD (2002) Improving intrinsic water-use efficiency and crop yield. **Crop Science** 42:122-131
- 187 Barbour, MM, Andrews, TJ and Farquhar GD. (2001) Correlations between oxygen isotope ratios of wood constituents of *Quercus* and *Pinus* samples from around the world. **Australian Journal of Plant Physiology** 28: 335-348
- 186 Roderick, ML, Farquhar, GD, Berry, SL, and Noble, IR. (2001) On the direct effect of clouds and atmospheric particles on the productivity and structure of vegetation. **Oecologia** 129: 21-30
- 185 [Rebetzke GJ, Condon AG, Richards RA and Farquhar, GD \(2002\) Selection for reduced carbon isotope discrimination increases aerial biomass and grain yield of rainfed bread wheat. **Crop Science** 42:739-745.](#)
- 184 Prasolova NV, Xu Z, Farquhar GD, Saffigna PG and Dieters M J. (2001) Canopy carbon and oxygen isotope composition of 9-year-old hoop pine families in relation to seedling carbon isotope composition and growth, field growth performance and canopy nitrogen concentration. **Canadian Journal of Forest Research**: 31, 673-681
- 183 Farquhar, GD, von Caemmerer, S and Berry, JA. (2001) Models of photosynthesis. **Plant Physiology** 125: 42-45
- 182 Miller, JM, Williams RJ and Farquhar, GD. (2001) Carbon isotope discrimination by a sequence of *Eucalyptus* species along a sub-continental rainfall gradient in Australia. **Functional Ecology** 15: 222-232
- 181 Franks, PJ and Farquhar, GD (2001) The effect of exogenous abscisic acid on stomatal development, stomatal mechanics and leaf gas exchange in *Tradescantia virginiana* L. *Plant Physiology* 125: 935-942
- 180 Xu ZH, Saffigna, PG, Farquhar, GD, Simpson, JA, Haines, RJ, Walker, S, Osborne, DO and Guinto, D. (2000) Carbon isotope discrimination and oxygen isotope composition in clones of the F1 hybrid between slash pine and Caribbean pine in relation to tree growth, water-use efficiency and foliar nutrient concentration. **Tree Physiology** 20(18): 1209-1217
- 179 Yong, JWH, Wong, SC, Letham, DS, Hocart, C. H. and Farquhar GD. (2000) Effects of elevated [CO₂] and nitrogen nutrition on cytokinins in the xylem sap and leaves of cotton. **Plant Physiology** 124: 767-780
- 178 Anderson, JE, Kriedemann, PE, Austin, MP and Farquhar, GD. (2000) Eucalypts forming a canopy functional type in dry sclerophyll forests respond differentially to environment. **Aust. J. Botany** 48:759-775
- 177 Prentice, IC, Farquhar, GD, Fasham, M., Goulden, M., Jaramillo, V., Kheshgi, H., Quere, C., Scholes, R. and Wallace, D., (2001). The Carbon Cycle and Atmospheric CO₂. Pp 183-237 *in* "Climate Change 2001: The Scientific Basis. Contribution of Working Group 1 to the Third Assessment Report of the Intergovernmental Panel on Climate Change" (Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, and C. A. Johnson eds). Cambridge University Press, Cambridge, United Kingdom and New York.
- 176 Lim, B, Farquhar, GD, and Ravindranath, NH. (2000) Implications of the Kyoto Protocol for the Reporting Guidelines. Chapter 6 *in* RT Watson, IR Noble *et al.* eds. Land Use, Land-Use Change and Forestry. Intergovernmental Panel on Climate Change, Cambridge University Press.

- 175 Barbour, MM, Fischer, RA, Sayre, KD and Farquhar, GD. (2000) Oxygen isotope ratio of leaf and grain material correlates with stomatal conductance and grain yield in irrigated wheat. **Aust. J. Plant Physiol** 27: 625-637
- 174 Prasolova, NV, Xu, ZH, Farquhar, GD, Saffigna PG, and Dieters MJ. (2000) Variation in branchlet $\delta^{13}\text{C}$ of 8-year-old hoop pine families (*Araucaria cunninghamii*) in relation to branchlet nitrogen concentration and tree growth in subtropical Australia. **Tree Physiology** 20: 1049-1055.
- 173 Barbour, MM, Schurr, U, Henry, BK, Wong, SC and Farquhar, GD. (2000) Variation in the oxygen isotope ratio of phloem sap sucrose from castor bean: Evidence in support of the Pécelet effect. **Plant Physiology** 123: 671-679
- 172 Barbour, MM and Farquhar, GD. (2000) Relative humidity- and ABA-induced variation in carbon and oxygen isotope ratios of cotton leaves. **Plant, Cell & Environment** 23: 473-485.
- 171 Henry, BK, Atkin, OK, Day, DA, Millar, AH, Menz, RI and Farquhar, GD. (1999) Calculation of the oxygen isotope discrimination factor for studying plant respiration. **Australian Journal of Plant Physiology** 26: 773-780.
- 170 Lloyd, J and Farquhar, GD. (2000) Do slow-growing species and nutrient-stressed plants consistently respond less to elevated CO_2 ? A clarification of some issues raised issues raised by Poorter (1998). **Global Change Biology** 6: 871-876
- 169 Roderick, ML, Berry, SL, Noble, IR and Farquhar, GD. (1999) A theoretical approach to linking the composition and morphology with the function of leaves. **Functional Ecology** 13: 683-695.
- 168 dePury, DGG and Farquhar, GD. (1999) A commentary on the use of a sun/shade model to scale from the leaf to a canopy. **Agricultural and Forest Meteorology** 95: 257-260.
- 167 Schulze, E-D, Farquhar, GD, Miller, JM, Schulze, W, Walker, BH and Williams, RJ. (1999) Interpretation of increased foliar $\delta^{15}\text{N}$ in woody species along a rainfall gradient in northern Australia. **Australian Journal of Plant Physiology** 26: 296-298.
- 166 Franks, PJ and Farquhar, GD. (1999) A relationship between humidity response, growth form and photosynthetic operating point in C_3 plants. **Plant, Cell & Env.** 22, 1337-1349
- 165 Korol, RL, Kirschbaum, MUF, Farquhar, GD and Jeffreys, M. (1999) The effect of water status and soil fertility on the C-isotope signature in *Pinus radiata*. **Tree Physiology** 19: 551-562.
- 164 Brugnoli, E. and Farquhar, GD. (2000) Photosynthetic fractionation of carbon isotopes. *In* Photosynthesis: Physiology and Metabolism (Advances in Photosynthesis volume 9). RC Leegood, TD Sharkey, S von Caemmerer (eds). Kluwer Academic Publishers. Chapter 17, pp 399-434.
- 163 Buckley, TN, Farquhar, GD and Mott, KA. (1999) Carbon-water balance and patchy stomatal conductance. **Oecologia** 118: 132-143.
- 162 Steffen, W *et al.* IGBP Terrestrial Carbon Working Group (1998) The terrestrial carbon cycle: Implications for the Kyoto Protocol. **Science** 280: 1393-1394.
- 161 Schulze, E-D, Williams, RJ, Farquhar, GD, Schulze, W, Langridge, J, Miller, JM and Walker, BH. (1998) Carbon and nitrogen isotope discrimination and nitrogen nutrition of trees along a rainfall gradient in northern Australia. **Aust. J. Plant Physiol.** 25: 413-425.
- 160 van Herwaarden, AF, Richards, RA, Farquhar, GD and Angus, JF (1998) 'Haying-

- off', the negative grain yield response of dryland wheat to nitrogen fertiliser. III. The influence of water deficit and heat shock. **Aust. J. Agricultural Research** 49: 1095-1110.
- 159 van Herwaarden, AF, Angus, JF, Richards, RA and Farquhar, GD. (1998) 'Haying-off', the negative grain yield response of dryland wheat to nitrogen fertiliser. II. Carbohydrate and protein dynamics. **Aust. J. Agricultural Research** 49: 1083-1093.
- 158 van Herwaarden, AF, Farquhar, GD, Angus, JF, Richards, RA and Howe, GN (1998) 'Haying-off', the negative grain yield response of dryland wheat to nitrogen fertiliser. I. Biomass, grain yield and water use. **Aust. J. Agricultural Research** 49: 1067-1081.
- 157 Farquhar, GD (1998) The significance of land clearing. Presented at APEC Study Centre's conference 'Kyoto - The Impact on Australia', Melbourne, 12-13 February.
- 156 von Caemmerer, S and Farquhar, GD. (1999) Leaf gas exchange: a case study on development of A:p_i curves. *In* 'Plants in Action'. BJ Atwell *et al.* (eds), Macmillan Press, Melbourne. Chapter 1.
- 155 Millar, AH, Atkin, OK, Menz, RI, Henry, BK, Farquhar, GD and Day, DA. (1998) Analysis of respiratory chain regulation in roots of soybean seedlings. **Plant Physiology** 117: 1083-1093.
- 154 Farquhar, GD (1997) Carbon dioxide and vegetation. **Science** 278: 1411.
- 153 Farquhar, GD, Barbour, MM and Henry, BK (1998) Interpretation of oxygen isotope composition of leaf material. Chapter 3 *in* Stable Isotopes: integration of biological, ecological and geochemical processes. H Griffiths (ed), BIOS Scientific Publishers Ltd, Oxford, pp 27-62.
- 152 Henderson, S, von Caemmerer, S, Farquhar, GD, Wade, L and Hammer, G (1998) Correlations between carbon isotope discrimination and transpiration efficiency in lines of the C₄ species *Sorghum bicolor* in the glasshouse and the field. **Aust. J. Plant Phys.** 25(1): 111-123.
- 151 Noble, IR, Gifford, RM and Farquhar, GD (1997) What do we know about impacts of action or no action? "A perspective from the biological sciences". *In* Summary of Proceedings of "The Challenge for Australia on Global Climate Change" 29-30 April 1997, Canberra. Published by The National Academies Forum, pp. 15-22.
- 150 Franks, PJ, Cowan, IR and Farquhar, GD (1998) A study of stomatal mechanics using the cell pressure probe. **Plant, Cell & Env.** 21(1): 94-100.
- 149 Lloyd, J, Kruijt, B, Hollinger, DY, Grace, J, Francey, RJ, Wong, S-C, Kelliher, FM, Miranda, AC, Farquhar, GD, Gash, JHC, Vygodskaya, NN, Wright, IR, Miranda, HS and Schulze, E-D (1997) A response to the comment 'Interpretation of Recycling Indexes' by Leonel da Silveira Lobo Sternberg on 'Vegetation effects on the isotopic composition of atmospheric CO₂ local and regional scales: theoretical aspects and a comparison between rain forest in Amazonia and a boreal forest in Siberia'. **Aust. J. Plant Physiol.** 24: 399-405.
- 148 Farquhar, GD, Henry, BK and Styles, JM (1997) A rapid on-line technique for determination of oxygen isotope composition of nitrogen-containing organic matter and water. **Rapid Communications in Mass Spectrometry** 11(14): 1554-1560.
- 147 Yong, JWH, Wong, SC and Farquhar, GD (1997) Stomatal responses to changes in vapour pressure difference between leaf and air. **Plant, Cell & Env.** 20(10): 1213-1216.

- 146 Caemmerer, S von, Ludwig, M, Millgate, A, Farquhar, GD, Price, D, Badger, M and Furbank, RT (1997) Isotope discrimination during C₄ photosynthesis: Insights from transgenic plants. **Aust. J. Plant Physiol.** 24: 487-494.
- 145 Buckley, TN, Farquhar, GD and Mott, KA (1997) The effects of patchy stomatal conductance distributions on gas-exchange calculations. **Plant, Cell & Env.** 20(7): 867-880.
- 144 Boyer, JS, Wong, SC and Farquhar, GD (1997) Carbon dioxide and water vapor exchange across leaf cuticle (epidermis) at various water potentials. **Plant Physiol.** 114(1): 185-191.
- 143 Bird, MI, Lloyd, J and Farquhar, GD (1996) Terrestrial carbon-storage from the last glacial maximum to the present. **Chemosphere** 33(9): 1675-1685.
- 142 de Pury, DGG and Farquhar, GD (1997) Simple scaling of photosynthesis from leaves to canopies without the errors of big-leaf models. **Plant, Cell & Env.** 20(5): 537-557.
- 141 Hammer, GL, Farquhar, GD and Broad, I (1997) On the extent of genetic variation for transpiration efficiency in Sorghum. **Aust. J. Agric. Res.** 48: 649-655.
- 140 Syvertsen, JP, Smith, ML, Lloyd, J and Farquhar, GD (1997) Net CO₂ assimilation, carbon isotope discrimination, growth and water use efficiency of citrus trees in response to nitrogen status. **J. Amer. Soc. Hort. Sci.** 122: 226-232.
- 139 von Caemmerer, S, Millgate, A, Farquhar, GD and Furbank, RT (1997) Reduction of Ribulose-1,5-bisphosphate carboxylase/oxygenase by antisense RNA in the C₄ plant, *Flaveria bidentis*, leads to reduced assimilation rates and increased carbon isotope discrimination. **Plant Physiol.** 113: 469-477.
- 138 Franks, PJ, Cowan, IR and Farquhar, GD (1997) The apparent feedforward response of stomata to air vapour pressure deficit: Information revealed by different experimental procedures with two rainforest trees. **Plant, Cell & Env.** 20: 142-145.
- 137a van Herwaarden, AF, Angus, JF, Farquhar, GD and Richards, RA (1996) Physiological responses of six Australian spring wheats to nitrogen fertiliser. In Proceedings of the Eight Australian Agronomy Conference, Toowoomba, pp 570-573.
- 137 Beemster, GTS, Masle, J, Williamson, RW and Farquhar, GD (1996) Effects of soil resistance to root penetration on leaf expansion in wheat (*Triticum aestivum* L.): Kinematic analysis of leaf elongation. **J. Exp. Bot.** 47: 1663-1678.
- 136 Lloyd, J, Kruijt, B, Hollinger, DY, Grace, J, Francey, RJ, Wong, S-C, Kelliher, FM, Miranda, AC, Farquhar, GD, Gash, JHC, Vygodskaya, NN, Wright, IR, Miranda, HS and Schulze, E-D (1996) Vegetation effects on the isotopic composition of atmospheric CO₂ local and regional scales: theoretical aspects and a comparison between rain forest in Amazonia and a boreal forest in Siberia. **Aust. J. Plant Physiol.** 23(3): 371-399.
- 135 López-Castañeda, C, Richards, RA, Farquhar, GD and Williamson, RE (1996) Seed and seedling characteristics contributing to variation in early vigour among temperate cereals. **Crop Science** 36: 1257-1266.
- 134 Anderson, JE, Williams, J, Kriedemann, P, Austin, M and Farquhar, GD (1996) Correlations between carbon isotope discrimination and climate of native habitats for diverse eucalypt taxa growing in a common garden. **Aust. J. Plant Physiol.** 23(3): 311-320.
- 133 Virgona, JM and Farquhar, GD (1996) Genotypic variation in relative growth rate and carbon isotope discrimination in sunflower is related to variation in photosynthetic

- capacity. **Aust. J. Plant Physiol.** 23(2): 227-36.
- 132 Melillo, J, Prentice, IC, Schulze, E-D and Farquhar, GD, Sala, OE (1996) Terrestrial ecosystems: Biotic feedbacks to climate. *In* IPCC WG I Report, Climate Change 1995, Chap 9, pp 449-481.
- 131 Lloyd, JJ and Farquhar, GD (1996) The CO₂ dependence of photosynthesis, plant growth responses to elevated atmospheric CO₂ concentrations, and their interaction with soil nutrient status. I. General principles and forest ecosystems. **Functional Ecology** 10(1): 4-32.
- 130 Kruijt, B, Lloyd, JJ, Grace, J, McIntyre, J, Farquhar, GD, Miranda, AC and McCracken, P (1996) Sources and sinks of CO₂ in Rondonia tropical rainforest. *In* Amazonian Deforestation and Climate. JHC Gash, CA Nobre, JM Roberts, RL Victoria (eds). Wiley, Chichester, UK, pp 331-351.
- 129 Barson, M, Lloyd, J and Farquhar, GD (1995) Land use changes: a surprise in the National Greenhouse Gas Inventory. **Search** 26(4).
- 128 Syvertsen, JP, Lloyd, JJ, McConchie, C, Kriedemann, PE and Farquhar, GD (1995) On the relationship between leaf anatomy and CO₂ diffusion through the mesophyll of hypostomatous leaves. **Plant, Cell & Env.** 18: 149-157
- 127 Franks, PJ, Cowan, IR, Tyerman, SD, Cleary, AL, Lloyd, JJ and Farquhar, GD (1995) Guard cell pressure/aperture characteristics measured with the pressure probe. **Plant, Cell & Env.** 18: 795-800.
- 126 Nageswara Rao, RC, Udaykumar, M, Farquhar, GD, Talwar, HS and Prasad, TG (1995) Variation in carbon isotope discrimination and its relation with specific leaf area and ribulose-1-5 biphosphate carboxylase content in groundnut genotypes. **Aust. J. Plant Physiol.** 22(4): 545-551.
- 125 Bird, MJ, Lloyd, JJ and Farquhar, GD (1994) Terrestrial carbon storage at the last glacial maximum. **Nature** 371: 566.
- 124 López-Castañeda, C, Richards, RA and Farquhar, GD (1995) Variation in early vigour between wheat and barley. **Crop Science** 35(2): 472-479.
- 123 Lloyd, JJ and Farquhar, GD (1994) ¹³C Discrimination during CO₂ assimilation by the terrestrial biosphere. **Oecologia** 99: 201-215.
- 122 Farquhar, GD, Condon, AG and Masle, J (1994) On the use of carbon and oxygen isotope composition and mineral ash content in breeding for improved rice production under favourable, irrigated conditions. *In* Breaking the Yield Barrier. KG Cassman (ed). International Rice Research Institute, pp 95-101.
- 121 Poorter, H and Farquhar, GD (1994) Transpiration, intercellular carbon dioxide concentration and carbon-isotope discrimination of 24 wild species differing in relative growth rate. **Aust. J. Plant Physiol.** 21: 507-516.
- 120 Hall, AE, Richards, RA, Condon, AG, Wright, GC and Farquhar, GD (1994) Carbon isotope discrimination and plant breeding. **Plant Breeding Reviews** 4: 81-113.
- 119 Flanagan, LB, Phillips, SL, Ehleringer, JR, Lloyd, J and Farquhar, GD (1994) Effect of changes in leaf water oxygen isotopic composition on discrimination against C¹⁸O¹⁶O during photosynthetic gas exchange. **Aust. J. Plant Physiol.** 21: 221-234.
- 118 Wright, GC, Rao, RCN and Farquhar, GD (1994) Water-use efficiency and carbon isotope discrimination in peanut under water deficit conditions. **Crop Science** 34: 92-97.
- 117 Nageswara Rao, RC, Williams, JH, Wadia, KDR, Hubick, KT and Farquhar, GD (1993) Crop growth, water-use efficiency and carbon isotope discrimination in

- groundnut (*Arachis hypogaea* L.) genotypes under end-of-season drought conditions. **Ann. Appl. Biol.** 122: 357-367.
- 116 Marshall, JD, Ehleringer, JR, Schulze, E-D and Farquhar, GD (1994) Carbon isotope composition, gas exchange, and heterotrophy in Australian mistletoes. **Functional Ecology** 8: 237-241.
- 115 Condon, AG, Richards, RA and Farquhar, GD (1993) Relationships between carbon isotope discrimination, water-use efficiency and transpiration efficiency for dryland wheat. **Aust. J. Agric. Res.** 44:2 1693-1711.
- 114 White, J, Molino, B, Labeyrie, L, Stauffer, B and Farquhar, GD (1993) How Reliable and Consistent Are Paleodata from Continents, Oceans, and Ice? *In* Global changes in the Perspective of the Past. JA Eddy and H Oeschger (eds). John Wiley, pp 73-102.
- 113 Farquhar, GD, Lloyd, J, Taylor, JA, Flanagan, LB, Syvertsen, JP, Hubick, KT, Wong, SC and Ehleringer, JR (1993) Vegetation effects on the isotopic composition of oxygen in atmospheric CO₂. **Nature** 363: 439-443.
- 112 Wong, SC, Kriedemann, PE and Farquhar, GD (1992) CO₂ x nitrogen interaction on seedling growth of four species of Eucalypt. **Aust. J. Bot.** 40: 457-472.
- 111 Masle, J, Farquhar, GD and Wong, SC (1992) Transpiration ratio and plant mineral content are related among genotypes of a range of species. **Aust. J. Plant Physiol.** 19: 709-21.
- 110 Farquhar, GD (1993) Plants for the Future. *In* Drought-Water-Flood. D Tier (ed). **ANZAAS**.
- 110a van Herwaarden, AF, Farquhar, GD and Richards, RA (1993) Grain yield, nitrogen uptake and sustainable wheat production: are varieties equal? *In* Proceedings of the Seventh Australian Agronomy Conference, Adelaide, p 366.
- 109 Wright, GC, Hubick, KT, Farquhar, GD and Rao, RCN (1993) Genetic and environmental variation in transpiration efficiency and its correlation with carbon isotope discrimination and specific leaf area in peanut. *In* Stable Isotopes and Plant Carbon/Water Relations. JR Ehleringer, AE Hall and GD Farquhar (eds). Academic Press, San Diego, pp 247-267.
- 108 Masle, J, Shin, JS and Farquhar, GD (1993) Analysis of restriction fragment length polymorphisms associated with variation of carbon isotope discrimination among ecotypes of *Arabidopsis thaliana*. *In* Stable Isotopes and Plant Carbon/Water Relations. JR Ehleringer, AE Hall and GD Farquhar (eds). Academic Press, San Diego, pp 371-386.
- 107 Farquhar, GD and Lloyd, J (1993) Carbon and oxygen isotope effects on the exchange of carbon dioxide between plants and the atmosphere. *In* Stable Isotopes and Plant Carbon/Water Relations. JR Ehleringer, AE Hall and GD Farquhar (eds). Academic Press, San Diego, pp 47-70.
- 106 Lloyd, J, Syvertsen, JP, Kriedemann, PE and Farquhar, GD (1992) Low conductances for CO₂ diffusion from stomata to the sites of carboxylation in leaves of woody species. **Plant, Cell & Env.** 15: 873-900.
- 105 Farquhar, GD and Sharkey, TD (1994) Photosynthesis and carbon assimilation. *In* Physiology and determination of crop yield. KJ Boote, JM Bennett, TR Sinclair, GM Paulsen (eds). ASA, CSSA, SSSA Madison, WI. Chapter 8A, pp 187-210.
- 104 Condon, AG, Richards, RA and Farquhar, GD (1992) The effect of variation in soil water availability, vapour pressure deficit and nitrogen nutrition on carbon isotope discrimination in wheat. **Aust. J. Agric. Res.** 43: 935-947.

- 103 Henderson, SA, von Caemmerer, S and Farquhar, GD (1992) Short term measurements of carbon isotope discrimination in several C₄ species. **Aust. J. Plant Physiol.** 19: 263-285.
- 102 Körner, Ch, Farquhar, GD, Wong, SC (1991) Carbon isotope discrimination by plants follows latitudinal and altitudinal trends. **Oecologia** 88: 30-40.
- 101 Dingkuhn, M, Farquhar, GD, De Datta, SK and O'Toole, JC (1991) Discrimination of ¹³C among upland rices having different water use efficiencies. **Aust. J. Agric. Res.** 42: 1123-31.
- 100 Hall, AE, Mutters, RG, Farquhar, GD (1992) Genotypic and drought- induced differences in carbon isotope discrimination and gas exchange of cowpea. **Crop Science** 32: 1-6.
- 99 Read, J and Farquhar, GD (1991) Comparative studies in *Nothofagus* (Fagaceae). I. Leaf carbon isotope discrimination. **Functional Ecology** 5: 684-695.
- 98 Wright, GC, Hubick, KT and Farquhar, GD (1991) Physiological analysis of peanut cultivar response to timing and duration of drought stress. **Aust. J. Agric. Res.** 42: 453-70.
- 97 Ehdaie, B, Hall, AE, Farquhar, GD, Nguyen, HT and Waines, JG (1991) Water-use efficiency and carbon isotope discrimination in wheat. **Crop Science** 31: 1282-1288.
- 96 Farquhar, GD (1991) Use of stable isotopes in evaluating plant water-use efficiency. Proc. International Symposium on the Use of Stable Isotopes in Plant Nutrition, Soil Fertility and Environmental Studies. IAEA/FAO, Vienna, pp 475-488.
- 95 Virgona, JM, Farquhar, GD and Hubick, KT (1990) Improving transpiration efficiency of sunflower using carbon isotope discrimination. Proc. 8th Workshop, The Australian Sunflower Association, pp 87-89.
- 94 Masle, J, Farquhar, GD and Gifford, RM (1990) Growth and carbon economy of wheat seedlings as affected by soil resistance to penetration and ambient partial pressure of CO₂. **Aust. J. Plant Physiol.** 17: 465-487.
- 93 Virgona, JM, Hubick, KT, Rawson, HM, Farquhar, GD and Downes, RW (1990) Genotypic variation in transpiration efficiency and carbon allocation during early growth in sunflower. **Aust. J. Plant Physiol.** 17: 207-214.
- 92 Raven, JA and Farquhar, GD (1990) The influence of N metabolism and organic acid synthesis on the natural abundance of C isotopes in plants. **New Phytol.** 116: 505-529.
- 91 Hammer, GL, Donatelli, M, Farquhar, GD, Hubick, KT and Wade, LJ (1989) Radiation-use efficiency, water-use efficiency and crop improvement in grain sorghum. Proc. Aust. Sorghum Workshop, Toowoomba, pp 184-91.
- 90 Giersch, C, Lammel, D and Farquhar, G (1990) Control analysis of photosynthetic CO₂ fixation. **Photosynth. Res.** 24: 151-165.
- 89 Collatz, GJ, Berry, JA, Farquhar, GD and Pierce, J (1989) The relationship between the Rubisco reaction mechanism and models of photosynthesis. **Plant, Cell & Env.** 13: 219-225.
- 88 Condon, AG, Farquhar, GD and Richards, RA (1990) Genotypic variation in carbon isotope discrimination and water-use efficiency in wheat. Leaf gas-exchange and whole plant studies. **Aust. J. Plant Physiol.** 17: 9-22.
- 87 Raven, JA and Farquhar, GD (1989) The greater ¹³C natural abundance in nitrate-grown than in ammonium-grown *Ricinus communis* is mainly a function of the lower ratio of CO₂- transport limitation to biochemical limitation of photosynthesis

- in nitrate-grown plants, with their higher organic onion content as a less significant factor. *In* Proceedings of the Second Advanced Course on Inorganic Nitrogen Metabolism. WR Ullrich (ed) Springer (1989).
- 86 Raven, JA and Farquhar, GD (1989) Leaf apoplast pH estimation in *Phaseolus vulgaris*. *In* Plant Membrane Transport: the Current Position. J Dainty, M De Michelis, E Marre and F Rasi-Caldogno (eds). Elsevier, pp 607-610.
- 85 Hubick, KT, Hammer, GL, Farquhar, GD, Wade, LJ, von Caemmerer, S and Henderson, SA (1990) Carbon isotope discrimination varies genetically in C₄ species. **Plant Physiol.** 91: 534-7.
- 84 Hall, AE, Mutters, RG, Hubick, KT and Farquhar, GD (1989) Genotypic differences in carbon isotope discrimination by cowpea under wet and dry field conditions. **Crop Science** 30: 300-305.
- 83 Bowman, WD, Hubick, KT, von Caemmerer, S and Farquhar, GD (1989) Short-term changes in leaf carbon isotope discrimination in salt and water stressed C₄ grasses. **Plant Physiol.** 90: 162-166.
- 82 Turner, NC, Nicolas, ME, Hubick, KT and Farquhar, GD (1989) Evaluation of traits for the improvement of water-use efficiency and harvest index. *In* Drought Resistance in Cereals. FWG Baker (ed). ICSU Press, Miami. Chapter 13, pp 177-189.
- 81 Evans, JR and Farquhar, GD (1991) Modelling canopy photosynthesis from the biochemistry of the C₃ chloroplast. *In* Modelling crop photosynthesis - from biochemistry to canopy. KJ Boote (ed). CSSA Special Publication Number 19, Chap 1. CCSA ASA, Madison, pp 1-15.
- 80 Farquhar, GD, Ehleringer, Jr and Hubick, KT (1989) Carbon isotope discrimination and photosynthesis. **Ann. Rev. Plant Physiol. Mol. Biol.** 40: 503-537.
- 79 Hubick, KT and Farquhar, GD (1989) Carbon isotope discrimination and the ratio of carbon gained to water lost in barley cultivars. **Plant, Cell & Env.** 12: 795-804.
- 78 Wright, GC, Hubick, KT and Farquhar, GD (1988) Discrimination in carbon isotopes of leaves correlates with water-use efficiency of field grown peanut cultivars. **Aust. J. Plant Physiol.** 15: 815-825.
- 77 Hubick, KT, Shorter, R and Farquhar, GD (1988) Heritability and genotype x environment interactions of carbon isotope discrimination and transpiration efficiency in peanut. **Aust. J. Plant Physiol.** 15: 799-813.
- 76 Farquhar, GD (1989) Models of integrated photosynthesis of cells and leaves. **Phil. Trans. Roy. Soc.** (Ser. B) 323 (1216): 357-368.
- 75 Masle, J, Doussinault, G, Farquhar, GD and Sun, B (1989). Foliar stage in wheat correlates better to photothermal time than to thermal time. **Plant, Cell & Env.** 12: 235-247.
- 74 Farquhar, GD and Sharkey, TD. Citation Classic (1988) **Commentary on Ann. Rev. Plant Physiol.** 33: 317-345. Current Contents ISI Press, Philadelphia.
- 73 Hubick, KT and Farquhar, GD (1987) Carbon isotope discrimination - selecting for water-use efficiency. **Australian Cotton Grower** 8(3): 66-68.
- 72 Farquhar, GD (1988) Atmosphere - land plant interactions. *In* Proceedings of the Elizabeth and Frederick White Symposium on Global Change. Australian Academy of Science, Canberra, pp 110-113.
- 71 Farquhar, GD, Wong, SC, Evans, JR and Hubick, KT (1989) Photosynthesis and gas exchange. *In* Plants under stress: physiology and ecology and their application to plant improvement. HG Jones, TJ Flowers, MB Jones (eds). Cambridge

- University Press, pp 47-69.
- 70 Brugnoli, E, Hubick, KT, von Caemmerer, S, Wong, SC and Farquhar, GD (1988) Correlation between the carbon isotope discrimination in leaf starch and sugars of C₃ plants and the ratio of intercellular and atmospheric partial pressures of carbon dioxide. **Plant Physiol.** 88: 1418-1424.
- 69 Bagnall, DJ, King, RW and Farquhar, GD (1988) Temperature-dependent feedback inhibition of photosynthesis in peanut. **Planta** 175: 348-354.
- 68 Parkhurst, DF, Wong, SC, Farquhar, GD and Cowan, IR (1988) Gradients of intercellular CO₂ levels across the leaf mesophyll. **Plant Physiol.** 86: 1032-1037.
- 67 Terashima, I, Wong, SC, Osmond, CB and Farquhar, GD (1988) Characterisation of non-uniform photosynthesis induced by abscisic acid in leaves having different mesophyll anatomies. **Plant Cell Physiol.** 29(3): 385-394.
- 66 Körner, C, Farquhar, GD and Roksandik, Z (1988) A global survey of carbon isotope discrimination in plants from high altitude. **Oecologia** 74: 623-632.
- 65 Ball, MC, Cowan, IR and Farquhar, GD (1988) Maintenance of leaf temperature and the optimisation of carbon gain in relation to water loss in a tropical rain forest. **Aust. J. Plant Physiol.** 15: 263-276.
- 64 Farquhar, GD (1988) Models relating subcellular effects of temperature to whole plant responses. *In* Plants and Temperature. SP Long and FI Woodward (eds). **Soc. Exp. Biol. Symp.** 42: 395-409.
- 63 Masle, J, Farquhar, GD (1988) Effects of soil strength on the relation of water-use efficiency and growth to carbon isotope discrimination in wheat seedlings. **Plant Physiol.** 86: 32-38
- 62 Farquhar, GD, Masle, J, Hubick, KT, von Caemmerer, S and Terashima, I (1987) Effects of drought, salinity and soil strength on photosynthesis, transpiration and carbon isotope composition of plants. **Current Topics in Plant Biochem. Physiol.** 6: 147-155.
- 61 Pate, JS and Farquhar, GD (1988) Role of the crop plant in cycling of nitrogen. *In* Advances in Nitrogen Cycling in Agricultural Ecosystems. JR Wilson (ed). CAB International, Aberystwyth, pp 23-45.
- 60 Condon, AG, Richards, RA and Farquhar, GD (1987) Carbon isotope discrimination is positively correlated with grain yield and dry matter production in field-grown wheat. **Crop Science** 27: 996-1001.
- 59 Ehleringer, JR, Ullmann, I, Lange, OL, Farquhar, GD, Cowan, IR, Schulze, E-D and Ziegler, H (1986) Mistletoes: a hypothesis concerning morphological and chemical avoidance of herbivory. **Oecologia** 70: 234-237.
- 58 Kirschbaum, MUF and Farquhar, GD (1987) Investigation of the CO₂ dependence of quantum yield and respiration in *Eucalyptus pauciflora*. **Plant Physiol.** 83: 1032-1036.
- 57 Farquhar, GD, Hubick, KT, Terashima, I, Condon, AG and Richards, RA (1986) Genetic variation in the relationship between photosynthetic CO₂ assimilation and stomatal conductance to water loss. *In* Progress in Photosynthesis. Biggins, J (ed). Vol. IV(5): 209-212.
- 56 Hubick, KT, Farquhar, GD and Shorter, R (1986) Correlation between water-use efficiency and carbon isotope discrimination in diverse peanut (*Arachis*) germplasm. **Aust. J. Plant Physiol.** 13: 803-816.
- 55 Farquhar, GD (1986) Climate-vegetation interactions: stomatal conductance and photosynthetic capacity. *In* Climate-Vegetation Interactions. C Rosenzweig and

- R Dickinson (eds). NASA Conference Publication 2440, pp 18-27.
- 54 Farquhar, GD, Hubick, KT, Condon, AG and Richards, RA (1989) Carbon isotope fractionation and plant water-use efficiency. *In* Stable Isotopes in Ecological Research. PW Rundel, JR Ehleringer and KA Nagy (eds). Springer Verlag, New York, pp 21-40.
- 53 Koppers, M, Wheeler, A, Koppers, BIL, Kirschbaum, MUF and Farquhar, GD (1986) Carbon fixation in eucalypts in the field. Analysis of diurnal variations in photosynthetic capacity. **Oecologia** 70: 273-282.
- 52 Evans, JR, Sharkey, TD, Berry, JA and Farquhar, GD (1986) Carbon isotope discrimination measured concurrently with gas exchange to investigate CO₂ diffusion in leaves of higher plants. **Aust. J. Plant Physiol.** 13: 281-292.
- 51 Wong, SC, Cowan, IR and Farquhar, GD (1985) Leaf conductance in relation to rate of CO₂ assimilation. III. Influences of water stress and photoinhibition. **Plant Physiol.** 78: 830-834.
- 50 Wong, SC, Cowan, IR and Farquhar, GD (1985) Leaf conductance in relation to rate of CO₂ assimilation. II. Effects of short term exposures to different photon flux densities. **Plant Physiol.** 78: 826-829.
- 49 Wong, SC, Cowan, IR and Farquhar, GD (1985) Leaf conductance in relation to rate of CO₂ assimilation. I. Influence of nitrogen nutrition, phosphorus nutrition, photon flux density and ambient partial pressure of CO₂ during ontogeny. **Plant Physiol.** 78: 821-825.
- 48 Ehleringer, JR, Schulze, E-D, Ziegler, H, Lange, OL, Farquhar, GD and Cowan, IR (1985) Xylem-tapping mistletoes: water or nutrient parasites? **Science** 227: 1479-1481
- 47 Brooks, A and Farquhar, GD (1985) Effect of temperature on the CO₂/O₂ specificity of ribulose-1,5- biphosphate carboxylase/oxygenase and the rate of respiration in the light. Estimates from gas-exchange measurements on spinach. **Planta** 165: 397-406.
- 46 Farquhar, GD and Kirschbaum, MUF (1985) Environmental constraints on carbon assimilation. *In* Regulation of sources and sinks in crop plants. BF Jeffcoat, AF Hawkins and AD Stead (eds). British Plant Growth Regulator Group Monograph No.12, pp 87-97.
- 45 Farquhar, GD and Richards, RA (1984) Isotopic composition of plant carbon correlates with water-use efficiency of wheat genotypes. **Aust. J. Plant Physiol.** 11: 539-552.
- 44 Kirschbaum, MUF and Farquhar, GD (1984) Temperature dependence of whole leaf photosynthesis in *Eucalyptus pauciflora*. **Aust. J. Plant Physiol.** 11: 519-538.
- 43 Francey, RJ, Barbetti, M, Bird, T, Beardsmore, D, Coupland, W, Dolezal, JE, Farquhar, GD, Flynn, RG, Fraser, PM, Gifford, RM, Goodman, HS, Kunda, B, McPhail, S, Nanson, G, Pearman, GI, Richards, NG, Sharkey, TD, Temple, RB and Weir, B (1984) Isotopes in Tree Rings. **CSIRO Aust. Div. Atmos. Res. Techn. Pap. No. 4**, 1-86.
- 42 Farquhar, GD and Wong, SC (1984) An empirical model of stomatal conductance. **Aust. J. Plant Physiol.** 11: 191-210.
- 41 von Caemmerer, S and Farquhar, GD (1985) Kinetics and activation of Rubisco and some preliminary modelling of RuP₂ pool sizes. *In* Kinetics of photosynthetic carbon metabolism in C₃-plants. Proceedings of the 1983 Conference at Tallinn. J Viil, G Grishina, A Laisk (eds). Estonian Academy of Sciences.

- 40 Ball, MC and Farquhar, GD (1984) Photosynthetic and stomatal responses of the grey mangrove, *Avicennia marina*, to transient salinity conditions. **Plant Physiol.** 74: 7- 11.
- 39 Ball, MC and Farquhar, GD (1984) Photosynthetic and stomatal responses of two mangrove species, *Aegiceras corniculatum* and *Avicennia marina* to long term salinity and humidity conditions. **Plant Physiol.** 74: 1-6.
- 38 von Caemmerer, S and Farquhar, GD (1984) Effects of partial defoliation, changes of irradiance during growth, short-term- water-stress, and growth at enhanced $p(\text{CO}_2)$ on the photosynthetic capacity of leaves of *Phaseolus vulgaris* L. **Planta** 160: 320-329.
- 37 Terry, N and Farquhar, GD (1984). Photochemical Capacity and Photosynthesis. *In* Control of crop productivity. CJ Pearson (ed), Academic Press, Sydney, pp 43-57.
- 36 Bradford, KJ, Sharkey, TD and Farquhar, GD (1983) Gas exchange, stomatal behaviour and $\delta^{13}\text{C}$ values of the flacca tomato mutant in relation to abscisic acid. **Plant Physiol.** 72: 245-250.
- 35 Farquhar, GD (1983) On the nature of carbon isotope discrimination in C_4 species. **Aust. J. Plant Physiol.** 10: 205-226.
- 34 Farquhar, GD, Wetselaar, R and Weir, B (1983) Gaseous nitrogen losses from plants. *In* Gaseous loss of nitrogen from plant-soil systems. JR Freney, JR Simpson (eds). Martinus Nijhoff/Dr W. Junk, The Hague, Dev. Plant Soil Sci. 9: 159-180.
- 33 Cowan, IR, Raven, JA, Hartung, W and Farquhar, GD (1982) A possible role for abscisic acid in coupling stomatal conductance and photosynthetic carbon metabolism in leaves. **Aust. J. Plant Physiol.** 9: 489-498.
- 32 Francey, RJ and Farquhar, GD (1982) An explanation of $^{13}\text{C}/^{12}\text{C}$ variations in tree rings. **Nature** 297: 28-31.
- 31 Comins, HN and Farquhar, GD (1982) Stomatal regulation and water economy in Crassulacean Acid Metabolism plants; an optimisation model. **J. Theor. Biol.** 94: 263-284.
- 30 Farquhar, GD and Sharkey, TD (1982) Stomatal conductance and photosynthesis. **Ann. Rev. Plant Physiol.** 33: 317- 345.
- 29 Galbally, IE, Farquhar, GD and Ayers, GP (1982) Interactions in the atmosphere of the biogeochemical cycles of carbon, nitrogen and sulfur. *In* The cycling of carbon, nitrogen, sulfur and phosphorus in terrestrial and aquatic ecosystems. IE Galbally, JR Freney (eds). Australian Academy of Science and Springer-Verlag, Canberra, pp 1-9.
- 28 Farquhar, GD, O'Leary, MH and Berry, JA (1982) On the relationship between carbon isotope discrimination and the intercellular carbon dioxide concentration in leaves. **Aust. J. Plant Physiol.** 9: 121-137.
- 27 Sharkey, TD, Imai, K, Farquhar, GD and Cowan, IR (1982) A direct confirmation of the standard method of estimating intercellular partial pressure of carbon dioxide. **Plant Physiol.** 69: 657-659.
- 26 Farquhar, GD, Ball, MC, von Caemmerer, S and Roksandic, Z (1982) Effect of salinity and humidity on $\delta^{13}\text{C}$ values of halophytes - evidence of diffusional isotope fractionation determined by the ratio of intercellular/atmospheric partial pressure of CO_2 under different environmental conditions. **Oecologia** 52: 121-124.

- 25 von Caemmerer, S and Farquhar, GD (1981) Some relationships between the biochemistry of photosynthesis and the gas exchange of leaves. **Planta** 153: 376-387.
- 24 Azcon-Bieto, J, Farquhar, GD and Caballero, A (1981) Effects of temperature, oxygen concentration, leaf age and seasonal variations on the CO₂ compensation point of *Lolium perenne* L.: Comparison with a mathematical model including non-photorespiratory CO₂ production in the light. **Planta** 152: 497-504.
- 23 Farquhar, GD and von Caemmerer, S (1982) Modelling of photosynthetic response to environmental conditions. In Encyclopedia of Plant Physiology, New Series Vol. 12B, OL Lange, PS Nobel, CB Osmond and H Ziegler (eds). Springer-Verlag, Heidelberg, pp 549-587.
- 22 Farquhar, GD (1980) Carbon isotope discrimination by plants and the ratio of intercellular and atmospheric CO₂ concentrations. In Carbon dioxide and climate: Australian research. GI Pearman (ed), Australian Academy of Science, Canberra, pp 105-110.
- 21 Farquhar, GD and von Caemmerer, S (1981) Electron transport limitations on the CO₂ assimilation rate of leaves: a model and some observations in *Phaseolus vulgaris* L. In Proceedings of Fifth International Congress on Photosynthesis. G Akoyunoglou (ed). Balaban, Philadelphia, Vol. 4, pp 163-175.
- 20 Raven, JA and Farquhar, GD (1980) Methylammonium transport in *Phaseolus vulgaris* leaf slices. **Plant Physiol.** 67: 859-863.
- 19 Wetselaar, R and Farquhar, GD (1980) Losses of nitrogen from the tops of plants. **Advances in Agronomy** 33: 263-302.
- 18 Farquhar, GD, Firth, PM, Wetselaar, R and Weir, B (1980) On the gaseous exchange of ammonia between leaves and the environment: measurements of the ammonia compensation point. **Plant Physiol.** 66: 710-714.
- 17 Farquhar, GD, Schulze, E-D and Koppers, M (1980) Responses to humidity by stomata of *Nicotiana glauca* L. and *Corylus avellana* L. are consistent with the optimisation of carbon dioxide uptake with respect to water loss. **Aust. J. Plant Physiol.** 7: 315-327.
- 16 Farquhar, GD, von Caemmerer, S and Berry, JA (1980) A biochemical model of photosynthetic CO₂ assimilation in leaves of C₃ species. **Planta** 149: 78-90.
- 15 Wong, SC, Cowan, IR and Farquhar, GD (1979) Stomatal conductance correlates with photosynthetic capacity. **Nature** 282: 424-426.
- 14 Farquhar, GD (1979) Carbon assimilation in relation to transpiration and fluxes of ammonia. In Photosynthesis and Plant Development. R Marcelle, H Clijsters and M van Poucke (eds). Junk, The Hague, pp 321-328.
- 13 Farquhar, GD, Wetselaar, R and Firth, PM (1979) Ammonia volatilization from senescing leaves of maize. **Science** 103: 1257-1258.
- 12 Farquhar, GD (1979) Models describing the kinetics of ribulose biphosphate carboxylase-oxygenase. **Arch. Biochm. Biophys.** 193(1): 456-468.
- 11 Farquhar, GD (1978) Feedforward responses of stomata to humidity. **Aust. J. Plant Physiol.** 5: 787-800.
- 10 Wong, SC, Cowan, IR and Farquhar, GD (1978) Leaf conductance in relation to assimilation in *Eucalyptus pauciflora* Sieb. ex Spring. Influence of irradiance and partial pressure of carbon dioxide. **Plant Physiol.** 62: 670-674.

- 9 Dubbe, D, Farquhar, GD and Raschke, K (1978) Effect of abscisic acid on the gain of the feedback loop involving carbon dioxide and stomata. **Plant Physiol.** 62: 413-417.
- 8 Farquhar, GD, Dubbe, DR and Raschke, K (1978) Gain of the feedback loop involving carbon dioxide and stomata. Theory and measurement. **Plant Physiol.** 62: 406-412
- 7 Raschke, K, Hanebuth, WF and Farquhar, GD (1978) Relationship between stomatal conductance and light intensity in leaves of *Zea mays* L., derived from experiments using the mesophyll as shade. **Planta** 139: 73-77.
- 6 Farquhar, GD and Raschke, K (1978) On the resistance to transpiration of the sites of evaporation within the leaf. **Plant Physiol.** 61: 1000-1005.
- 5 Berry, JA and Farquhar, GD (1978) The CO₂ concentrating function of C₄ photosynthesis. A biochemical model. *In Proc. 4th International Congress on Photosynthesis, Reading, England, 1977*, pp 119-131, Hall, D, Coombs, J, Goodwin, T (eds). The Biochemical Society, London.
- 4 Cowan IR and Farquhar GD (1977) Stomatal function in relation to leaf metabolism and environment. DH Jennings (ed). **Soc. Exp. Biol. Symp.** 31: 471-505.
- 3 Farquhar GD and Cowan IR (1974) Oscillations in stomatal conductance. The influence of environmental gain. **Plant Physiol.** 54: 769-772.
- 2 Farquhar GD (1973) A study of the responses of stomata to perturbations of environment. PhD Thesis, ANU.
- 1 Farquhar GD and Field CD (1971) Transpiration linked short-circuit currents in the xylem of a liana. **J. Exp. Bot.** 22(73): 818-829.