**Curriculum vitae - Gregory John REBETZKE**



Birthdate: 23 December 1964, Brisbane QLD Australia

Citizenship: Australian

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**Research Area**

Implementing physiological and quantitative genetic understanding to fast-track delivery of elite wheat germplasm containing traits for improved adaptation to droughted and changing climates

### Academic Record/Qualifications

1985 B.App.Sci. (Hons) (Horticultural Technology), Queensland Agricultural College (University of Queensland), Lawes, Queensland, AUSTRALIA

1991 M.Agr.Sc. University of Queensland, Brisbane, Queensland, AUSTRALIA

1995 PhD. Genetics and Plant Breeding, North Carolina State University, Raleigh, North Carolina, USA

##### Career History

1995 Postdoctoral Fellow, Cooperative Research Centre for Plant Science (ANU/CSIRO)

1998+ Research Scientist, CSIRO Plant Industry/CSIRO Agriculture and Food

**Awards**

1998 CSIRO Plant Industry Chief’s team award (Transpiration efficiency in wheat)

1. CSIRO Medal (Delivery of world’s first drought-tolerant, high transpiration efficient wheat varieties)
2. CSIRO Plant Industry award (Learning culture award for mentoring)
3. CSIRO Plant Industry award (Research team award)
4. CSIRO Plant Industry award (Learning culture award for training and mentoring)
5. CSIRO OCE Newton Turner career award for senior scientists
6. CSIRO OCE Visiting Scientist award

2014 Australia Science Academy Travel award

2021 Australian Grains Industry ‘Recognising and Rewarding Research Excellence’ Award (Grains Research and Development Corporation)

2023 Australian Grains Industry ‘Seed of Light’ Award (Grains Research and Development Corporation)

##### Editorial Appointments *(since 2000)*

2002 Editor, *Crop Science*

2007+ Editorial Board, *Field Crops Research*

2009 Editor, *Crop and Pasture Science*

2012+ Editor, *Journal of Experimental Botany*

2013 Editorial Board, *Food and Energy Security*

2016 Guest Editor (Special edition ‘Maximal yield potential’), *Field Crops Research*

2016 Guest Editor (Special edition ‘Delivering value from global root research’), *Journal of Experimental Botany*

2018+ Editorial Board, *Agronomy MDPI*

2022+ Editor, *Frontiers in Plant Science*

##### Academic and Research Leadership *(since 2000)*

2000 Subprogram Leader, ‘Physiological and Molecular Wheat Breeding’ CSIRO Plant Industry (24 staff)

2004 Stream Leader ‘Designing crops and pastures for Australian environmental challenges’ (11 projects, $21M annual budget)

2009+ CSIRO-breeding company relationship lead and coordinator (2009-2021)

2010+ CSIRO-Bayer Collaboration Scientific Committee (2010-15)

2011 Research Program Leader ‘High Performance Crops for Australia’ CSIRO Plant Industry (82 staff)

2014 Research Group Leader ‘Southern Crops’ CSIRO Agriculture and Food (25 staff)

2015 Impact Champion Lead ‘Breeding Resilient Crops’ CSIRO Agriculture and Food (17 projects, $11M annual budget)

2015 GRDC Western Region panel member (science expert)

2017+ Adjunct Professor, University of Western Australia, Perth WA Australia

2019+ Adjunct Professor, Charles Sturt University, Wagga Wagga, NSW Australia

2023+ Science Advisory Board - International Graduate School, Uni. Giessen- Uni. QLD

##### Invited Keynote Speaker at International Meetings *(since 2000)*

2007 ‘What’s in the pipeline for new drought tolerance genetics?’, North American Wheat Workers Workshop, Saskatoon Canada

1. ‘Breeding improved establishment and early biomass in wheat’, Dual Purpose Wheat Workshop, Oklahoma USA

2009 ‘Translating physiological research to genetic improvement in drought tolerance’, Interdrought III, Shanghai China

2010 ‘Breeding International Workshop on Food Security, Beijing China

2014 ‘Delivering improved drought tolerance in future wheats’, Montevideo Uruguay

2014 ‘Translating basic research to developing world farmers’, CIAT, Bogota Columbia

2015 ‘Drought tolerance in wheat: From concept to delivery’, Global Food Security Meeting, Lancaster UK

2017 ‘Breeding drought tolerance in bioenergy crops’, WATBIO, Oxford UK

2019 ‘Breeding greater water use efficiency in wheat’, American Agronomy Meetings, San Antonio USA

2023 ‘Genetic improvement of early shoot and root growth’, Rank Symposium, Lancaster UK

**National and International Consultancies *(since 2000)***

2000 Invited major review of Australian grains industry investment into a national strategy for soybean breeding (GRDC)

2002+ Invited review Canola Breeders Western Australia (CIC)

2003Invited review of Australian grains industry national investment and strategy into Molecular Genetics and Breeding (NWMMP)

2006 Invited review Vietnam soybean breeding (ACIAR)

2007 Invited chair of review of Australian grains industry investment into Statistics (GRDC)

2007 Invited chair of review of Australian grains industry investment into Quantitative Genetics (GRDC)

2012 Invited review of commercial seed company global efforts in statistics in breeding (CIC)

2012 Invited review of investment in Genomic Prediction in sugar breeding (Sugar Research Australia)

2013 Invited strategic review of QLD State Department Plant Science Statistics and Biometry

2014 Invited review of Australian grain’s industry needs in crop modelling (GRDC)

2014 Invited review of strategic needs in Australian grains investment in Nitrogen-Use Efficiency (GRDC)

2014 Invited review of investment in Water-Use Efficiency in sugar breeding (Sugar Research Australia)

2014 Invited review of investment in Nitrogen Uptake/Nitrogen-Use Efficiency in sugar breeding (Sugar Research Australia)

2015+ Invited Grain’s Industry GRDC Western region panel member (2015-20)

2016+ Invited reviewer on New Zealand Pasture Genomics Science Advisory Panel (2016-20)

2017 Invited expert for Australian grains industry in strategy for national pulse investment (GRDC)

2017 Invited expert for Australian grains industry in strategy for national oat investment (GRDC)

2017 Invited expert for Australian grains industry in strategy for digital investment (GRDC)

2017 Invited expert for Australian grains industry in water productivity/drought investment (GRDC)

2017 Invited expert for Australian grains industry in strategy for Phenomics investment (GRDC)

2019 Invited expert for Australian grains industry in strategy for cereal nitrogen investment (GRDC)

2019 Invited review of ICARDA wheat breeding program (BPAT, Bill and Melinda Gates Foundation)

2020 Invited review of ICRISAT sorghum breeding program (BPAT, Bill and Melinda Gates Foundation)

2020 Invited review of CIMMYT wheat breeding program (BPAT, Bill and Melinda Gates Foundation)

2020 Invited review of New Zealand Pea Breeding program (New Zealand Plant &Food)

2020+ Invited member of the ‘Global Wheat Initiative’ representing global investment in wheat research

2020+ Invited chair of the scientific steering committee of ‘AHEAD’ (Alliance for Wheat Adaptation to Heat and Drought)

2022+ Invited genetics/physiology expert, European ‘Root2Res’ scientific steering committee

2023+ Science Advisory Board – ‘Hy-Gain for Smallholders’ (Bill and Melinda Gates Foundation)

*2001+ Invited grant reviews globally: BBSRC (Britain), BARD (US-Israel), Germany, Canada, ERA/GCP, Australia-India Strategic Fund, ACIAR*

**Professional Activities *(since 2000)***

2000 Invited Speaker, Australian Association of Agricultural Consultants National Conference, Wagga Wagga NSW

2000 Invited Speaker, 7th Annual Conference Joint Centre for Crop Improvement, Rutherglen, VIC

2003+ Australian Grain Biosecurity Committee representative, Canberra ACT

2003 Invited Speaker, Australian Institute Agricultural Scientists, Canberra ACT

2003 Scientific organising committee, 4th International Crop Science Congress, Brisbane QLD

2004 Organising committee, 11th Australian Wheat Assembly, Canberra ACT

2004 Invited Chair, 4th International Crop Science Congress, Brisbane QLD

1. Invited Speaker, Generation Challenge Program, Beijing China
2. Invited Speaker, International Drought Genomics Meeting, Adelaide SA
3. Invited Chair, Gordon Research Conference: Salt and Water Stress in Plants, Montana USA

2008 Invited Chair, Quantitative Genetics, Generation Challenge Program, Beijing China

2008 Invited speaker, Dual purpose wheat workshop, Oklahoma USA

2008+ Science Research committee, Cottech and Cotton Breeding Australia

2009 Invited Speaker, Eucarpia, Freising Germany

2010 Invited Speaker, 7th Annual Australia-China Symposium, Adelaide SA

2010 Invited speaker, GCP Cereal Drought Workshop, Aleppo Syria

2011 Invited Speaker Australian Wheat Breeders Assembly, Perth WA

2011 Invited Speaker ACPFG Seminar Series, Adelaide SA

2013 Invited Speaker, Australian Agronomy Conference, Armidale VIC

2013 Invited Speaker, China-EU-Australia workshop on p**henotyping for abiotic stress tolerance and water use efficiency in crop breeding**, Yangling China

2013 Keynote Speaker, Australian Institute of Agricultural Scientists Forum, Perth WA

2013+ Science Organizing Committee, Interdrought IV, V, VI, VII, Various locations

2013 Coordinator, Crawford MasterClass on Adaptation to Drought, Perth WA

2013+ Science advisory committee, University of Western Australia Plant Breeding and Genetics training, Perth WA

2013 Science Organizing Committee, 13th Australian Plant Breeding Conference, Melbourne VIC

2014 Invited Speaker, Bayer Statistical and Experimental Designs for METs, Gaterslaben Germany

2014 Invited Chair, Bayer Statistical Genetics, Gaterslaben Germany

2014 Invited Speaker, GRDC National Weeds Forum, Canberra ACT

2014 Invited Speaker, Crop Science Congress, Melbourne VIC

2014 Invited Speaker, GRDC National Nitrogen Forum, Melbourne VIC

2014 Invited Speaker, Association of Applied Biologists, Lancaster UK

2014 Invited Speaker, Translation Conference CIAT, Cali Columbia

2015 Invited Speaker, First Latin American Conference on Plant Phenotyping and Phenomics for Breeding, Talca Chile

2015 Organizing Committee, Society of Root Research, Canberra ACT

2015 Invited Speaker, ICRISAT Seminar Series, Hyderabad India

2016 Invited Speaker, 7th International Crop Science Congress, Beijing China

2016 Invited Speaker, IPPN 2nd International Conference, El Batan Mexico

2016 Invited Speaker, 4th Biennial Australian Statistics Conference, Bermagui NSW

2017 Invited Speaker, International Tropical Agriculture (TropAg) Conference, Brisbane QLD

2017 Invited Speaker, Transformative Workshop: Advancing Crop Resilience, Ottawa Canada

2017 Invited Public Lecture, Lancaster University, Lancaster UK

2017 Invited Speaker, IRRI Seminar Series, Los Banos Philippines

2019 Invited Speaker, International Tropical Agriculture (TropAg) Conference, Brisbane QLD

2019 Invited Chair, Australian Agronomy Conference, Wagga Wagga NSW

2019 Science Organizing Committee, 14th Australian Plant Breeding Conference, Gold Coast QLD

2022 Invited Speaker, International Union for the Protection of New Varieties of Plants, Zurich Switzerland

2022 Invited Speaker, COMBIO, Melbourne VIC

2022 Invited Chair and session organiser, Tropical Agriculture Conference, Brisbane QLD

*2000+ 47 invited Australian grain industry (GRDC Update) talks throughout Australia (see later for titles)*

**Student Supervision and Scientific Visitors**

10 graduated PhDs, 1 current PhD

7 graduated Honours

3 Postdoctoral Fellows

13 PhD and Master’s advisory roles

6 international scientific visitors

7 formal mentoring roles

Scientist in Schools presenter (primary and secondary schools)

**Major Research Grants Initiated and Led**

2010 Development of a system of Managed Environment Facilities (GRDC)

2010 Genetic variation in nitrogen uptake and remobilisation in wheat (CIC)

2011 Use of managed environments to validate and deliver key physiological traits for improving wheat performance under drought (GRDC)

2013 Weed competitiveness wheat germplasm development (GRDC)

2013 Genetic architecture of Nitrogen-Use Efficiency in wheat (CIC)

2014 Water productivity traits – Trait × trait modelling of water productivity (GRDC)

2015 New dwarfing genes, modified leaf architecture and high rates of grain-filling in the MEF (GRDC)

2015 Genetic variation for seedling drought tolerance in wheat (GRDC)

2017 Coupling genetics for reduced-tillering and high early vigour in wheat (CIC)

2018 Integrating genomic prediction with high-throughput phenotyping of complex traits (CSIRO)

2019 High-throughput phenotyping tools for growth traits in commercial breeding populations (CIC)

2020 Translating improved seedling establishment learnings from wheat to other crops (CSIRO)

2021 100-day wheats for later sowing with changing climates (GRDC)

2022 Gene editing improved wheat quality (CIC)

2022 Delivering long coleoptile wheat genetics to farmers (GRDC)

**Commercial Wheat Varieties/Germplasm Delivered to Breeding Companies**

*Commercial varieties*

* ‘LC Mace’ (Aust Standard White, long coleoptile, milling wheat for deep sowing)
* ‘LRPB Bale’ (Aust. Premium White, slow awnless milling wheat variety with potential as quality hay in frost regions)
* ‘LRPB Dual’ (Aust. Hard, mid-quick awnless milling wheat variety with potential as quality hay in frost regions)
* ‘EGA Drysdale’ (high transpiration efficient, Aust. Hard, mid-quick wheat variety)
* ‘EGA Rees’ (high transpiration efficient, Aust. Prime Hard, mid-quick wheat variety)

*Elite wheat germplasm (Material Transfer Agreements to breeding companies)*

* Enriched awnless feed wheats in Espada, Gregory, Magenta, Scout, Yitpi genetic backgrounds for commercial release (S&W Seeds)(CIC)
* 100-day, high biomass topcross wheats in multiple genetic backgrounds (all breeding companies)
* Awned-awnless near-isogenic pairs in six elite genetic backgrounds (all breeding companies)
* Awnless topcross breeding lines in two elite genetic backgrounds (all breeding companies)
* Reduced tillering × high early vigour backcross wheats in multiple genetic backgrounds (CIC)
* High grain protein Suntop/Spitfire RILs (CIC)
* Long coleoptile *Rht13* and *Rht1/2* NILs in multiple genetic backgrounds (all breeding companies)
* Long coleoptile *Rht18* and *Rht1/2* NILs in multiple genetic backgrounds (all breeding companies)
* Weed-competitive, high vigour topcross breeding lines (all breeding companies)
* High root biomass topcross lines (CIC)
* Halberd NILs varying for 10 Gibberellic acid-insensitive and Gibberellic acid-sensitive dwarfing genes (all breeding companies)
* Reduced-tillering advanced breeding lines (CIC)
* Transpiration-efficient NILs (tails) in multiple genetic backgrounds (GRDC)

*Elite Soybean germplasm (published registration details)*

* High oleic, low linolenic acid soybean germplasm: N98-4445A (Registration no. 162) (Crop Science Society of America)
* Reduced palmitic, high oleic acid soybean germplasm: N94-2575 (Registration no. GP-261) (Crop Science Society of America)
* Reduced palmitic acid soybean germplasm: C1943 (Registration no. GP-262) (Crop Science Society of America)

**Most significant publications (10 papers incl. short description why the paper is important; 50 words)**

1. Zhao Z, Wang E, Kirkegaard J, **Rebetzke GJ** (2022) Novel wheat varieties facilitate deep sowing to beat the heat of changing climates. *Nature Climate Change* **12**, 291-296

*Reporting of projected yield benefit with deep sowing long coleoptile wheats across Australia. Summarises modelling of climate and crop growth, and sensitivity analysis of validated deep-sowing field studies of long and short coleoptile near-isolines. GJR designed and analysed the field experiments, assisted parameterisation of the model, and writing (50% contribution)*

1. **Rebetzke GJ**, Jimenez-Berni J, RA Fischer, Deery D, Smith D (2019) High-throughput phenotyping to enhance the use of crop genetic resources. *Plant Science* **282**, 40-48

*Invited critical review of methods developed for high-throughput phenotyping of genetic resources and derived segregating progeny for water-use efficiency traits. Data represents research undertaken in early vigour/leaf area, biomass and canopy temperature from GJR and colleagues. GJR wrote this invited review (95% contribution)*

1. Jimenez-Berni J, Deery D, Rozas-Larraondo P, Condon AG, **Rebetzke GJ**, James RA, Bovill WD, Furbank R, Sirault XS (2018) High throughput determination of plant height, ground cover, and above-ground biomass in wheat with LiDAR. *Frontiers in Plant Science* Article **9**, 237

*Demonstrated potential for LiDAR (Light Detection and Ranging) in non-destructive prediction of plant height, leaf area/orientation and biomass in large wheat breeding experiments. Growth stage-specific and -generalised predictions are given in establishing high repeatability for all growth parameters. GJR designed some field experiments, analysis and writing (30% contribution)*

1. **Rebetzke GJ**, Bonnett DG, Reynolds MR (2016) Awns reduce grain number to increase grain size and harvestable yield in irrigated and rainfed spring wheat. *Journal of Experimental Botany* **67**, 2573-2586

*Comprehensive assessment of 42 awned-awnless wheat pairs (five genetic backgrounds) in drought- and heat-limited field environments globally. Awns increased grain size through compensation from reduced floret fertility and grain number. Demonstrated potential to breed awnless wheats for droughted environments. GJR co-designed, analysed and led reporting of the research (75% contribution)*

1. **Rebetzke GJ**, Condon AG, Rattey AR, Farquhar GD, Richards RA (2013) Genomic regions for canopy temperature and their genetic association with stomatal conductance and grain yield in bread wheat (*Triticum aestivum* L.). *Functional Plant Biology* **40**, 14-26

*Highly-cited paper (228 cites) establishing first genetic link between canopy temperature (as surrogate for stomatal conductance) and canopy height arising from boundary layer factors addressing uncertainty with canopy temperature as a surrogate for yield in breeding. Statistical models are provided to address canopy height-temperature covariances. GJR designed, analysed and reported the research (95% contribution)*

1. **Rebetzke GJ**, Richards RA, Fettell NA, Long M, Condon AG, Botwright TL (2007) Genotypic increases in coleoptile length improves wheat establishment, early vigour and grain yield with deep sowing. *Field Crops Research* **100**, 10-23

*Highly cited paper (253 cites) validating emergence with deep-sowing of long coleoptile wheats containing alternative dwarfing genes. Validated then new coleoptile length phenotyping under high throughput, repeatable glasshouse conditions and now used in commercial breeding translated to improved establishment in the field. GJR designed, analysed and reported the research (85% contribution)*

1. Condon AG, Richards RA, **Rebetzke GJ**, Farquhar GD (2004) Breeding for high water use efficiency. *Journal of Experimental Botany* **55***,* 2447-2460

*Highly-cited paper (1353 cites) summarising physiology and genetics research, and efforts at CSIRO and elsewhere to develop selection methods for efficient breeding of water-use efficiency in wheat and translation to other crops. GJR led the writing of the key breeding section of the paper (35% contribution)*

1. **Rebetzke GJ**, Condon AG, Richards RA, Farquhar GD (2002) Selection for reduced carbon-isotope discrimination increases aerial biomass and grain yield of rainfed bread wheat. *Crop Science* **42**, 739-745

*Highly cited paper (541 cites) First report of targeted breeding of carbon isotope discrimination (surrogate for transpiration efficiency;TE) was associated with greater harvest index and grain yield especially in droughted environments. Also, first report of CSIRO-bred high TE wheat varieties Drysdale and Rees. GJR designed, analysed and reported the research (85% contribution)*

1. Ellis MH, Spielmeyer W, Gale K, **Rebetzke GJ**, Richards RA (2002) Perfect markers for the *Rht-B1b* and *Rht-D1b* dwarfing mutations in wheat (*Triticum aestivum* L.). *Theoretical and Applied Genetics* **105**, 1038-1042

*Highly cited paper (648 cites) Reported development of perfect molecular markers now globally used in the identification and selection of the green revolution Rht1 and Rht2 dwarfing genes. These are amongst if not the most widely used molecular markers in breeding globally. GJR analysed and co-authored the research (30% contribution)*

1. **Rebetzke GJ**, Appels R, Morrison A, Richards RA, McDonald G, Ellis MH, Spielmeyer W, Bonnett DG (2001) Quantitative trait loci on chromosome 4B for coleoptile length and early vigour in wheat (*Triticum aestivum* L.). *Australian Journal of Agricultural Research* **52**, 1221-1234

*First detailed report of genetic architecture/QTL for early growth in wheat (and broadly any cereal). Established negative genetic effect of green revolution Rht1 dwarfing gene on seedling emergence and identified five novel QTL including now important ‘LCol-A1’ allele used in breeding. GJR designed, analysed and reported the research (70% contribution)*

**Full publication list**

Citation summary from Scopus (Google Scholar in parenthesis) (as of February 15, 2023):

Articles with citation data: 148 (148)

Sum of times cited: 10601 (17350)

Average citations per article: 72 (117)

H-index: 57 (65)

**Scholarly book chapters**

1. Sukumaran S, **Rebetzke G**, Mackay I, Bentley AR, Reynolds MP (2022) Pre-breeding Strategies. In ‘*Wheat Improvement’* (Eds MP Reynolds and H Braun). (Springer, Cham) pp. 451-469.
2. Walsh M, Broster J, Chauhan B, **Rebetzke GJ,** Pratley J (2019) Weed control in cropping systems – past lessons and future opportunities. *In* ‘Australian Agriculture in 2020: From Conservation to Automation’ (Eds J Pratley and J Kirkegaard) (Agronomy Australia and Charles Sturt University, Wagga Wagga) pp. 153-172.
3. **Rebetzke GJ**, Ingvordsen C, Bovill WD, Trethowan R, Fletcher A (2019) Breeding Evolution for Conservation Agriculture.*In* ‘Australian Agriculture in 2020: From Conservation to Automation’ (Eds J Pratley and J Kirkegaard) (Agronomy Australia and Charles Sturt University, Wagga Wagga) pp. 273-287.
4. Garnett TP, **Rebetzke GJ** (2013) Improving crop nitrogen use in dryland farming. *In* ‘Improving Water and Nutrient-Use Efficiency in Food Production Systems’ (Ed. Z. Rengel) (John Wiley & Sons, New York) pp. 123-144.
5. Reynolds M, **Rebetzke GJ** (2010) Application of plant physiology in wheat breeding. *In* ‘*The* *Wheat Book Vol 2 - A history of wheat breeding’* (Eds AP Bonjean, WJ Angus, M van Ginkel) (Lavoisior, France) pp 807-906
6. Reynolds M, Manes Y, **Rebetzke GJ** (2010) Tools in selection for physiological traits. *In* ‘The CIMMYT Wheat Handbook’. (Ed. H Braun) (CIMMYT, Mexico) pp. 13-28.
7. Richards RA, **Rebetzke GJ**, Condon AG, Watt M (2010) Breeding to improve grain-yield in water-limited environments: The CSIRO experience with wheat. *In* ‘Crop Stress Management and Global Climate Change’ (Eds Araus JL, Slafer GA) (CABI, London) pp. 105-122.
8. **Rebetzke GJ**, Chapman SC, McIntyre L, Condon AG, Richards RA, Watt M, van Herwaarden A (2009) Grain yield improvement in water-limited environments. *In* ‘Wheat: Science and Trade’ (Ed. BF Carver) (Wiley-Blackwell, Ames Iowa) pp. 215-249
9. Lambrides CJ, **Rebetzke GJ**, Laidlaw H, Godwin I(2008) Molecular breeding for abiotic stress resistance. *In* ‘Principles and practices of Plant Molecular Mapping and Breeding’ (Eds C Cole and A Abbott) (Science Publ. Inc, USA) pp. 165-215.
10. Chapman SC, Wang J, **Rebetzke GJ**, Bonnett DG (2008) Accounting for variability in the direction and use of markers for simple and complex traits. *In* ‘Scale and Complexity in Plant Systems Research, Gene-Plant-Crop Relations’ (Eds JHJ Spiertz *et al.*) (Springer, Netherlands) pp. 37-44.
11. **Rebetzke GJ**, van Herwaarden A, Jenkins C, Ruuska S, Tabe L, Lewis D, Weiss M, Richards RA (2007) Genetic control of water-soluble carbohydrate reserves in bread wheat. *In* ‘Wheat Production in Stressed Environments’ (Eds H T Buck *et al.*) (Springer, Netherlands) pp. 349-356.
12. Condon AG, Reynolds MP, **Rebetzke GJ**, van Ginkel M, Richards RA, Farquhar GD (2007) Using stomatal aperture traits to select for high yield potential in bread wheat. *In* ‘Wheat Production in Stressed Environments’ (Eds HT Buck *et al.*) (Springer, Netherlands) pp. 617-624.
13. Bonnett DG, Hyles J, **Rebetzke GJ** (2007) Efficient integration of molecular and conventional breeding methodologies. *In* ‘Wheat Production in Stressed Environments’ (Eds HT Buck *et al.*) (Springer, Netherlands) pp. 747-752.
14. Ellis MH, Bonnett DG, **Rebetzke GJ** (2007) Borlaug, Strampelli and the worldwide distribution of *Rht8*. *In* ‘Wheat Production in Stressed Environments’ (Eds HT Buck *et al.*) (Springer, Netherlands) pp. 787-792.
15. Reynolds M, **Rebetzke GJ**, Pellegrineschi A, Trethowan R(2006) Drought adaptation in wheat. *In* ‘*Drought Adaptation in Cereals’* (Ed. JM Ribaut) (Haworth Press, New York) pp. 401-436.
16. Condon AG, Richards RA, **Rebetzke GJ**, Farquhar GD (2006) The application of carbon isotope discrimination in cereal improvement. *In* ‘*Drought Adaptation in Cereals’* (Ed. JM Ribaut) (Haworth Press, New York) pp. 171-211.
17. Richards RA, **Rebetzke GJ**, Appels R, Condon AG (2002) Physiological traits to improve the yield of rainfed wheat: Can molecular genetics help? *In* ‘Molecular approaches for the genetic improvement of cereals for stable production in water-limited environments’ (Eds J Ribaut *et al.*) (CIMMYT, Mexico) pp. 54-58.

### Refereed journal articles

1. Stummer BE, Flohr BM, McBeath T, **Rebetzke GJ**, Meiklejohn R, Ware A (2023) Deep sowing of long coleoptile wheat into subsoil moisture: soil texture and crop establishment impacts. *Environmental Research Communications* **XX**, XX-XX
2. Faveri JD, Verbyla AP, **Rebetzke GJ** (2022) Random regression models for multi-environment, multi-time (MEMT) data from crop variety selection trials. *Crop and Pasture Science* **XX**, XX-XX
3. Bowerman A, Byrt C, Roy S, Whitney S, Mortimer JC, Ankey RA, Giliham M, Zhang D, Millar AA, **Rebetzke GJ**, Pogson B (2023) Potential abiotic stress targets for modern genetic manipulation. *The Plant Cell* **35**, 139-161 (Invited)
4. Langridge P, **Rebetzke GJ**, et al. (2023) Meeting the Challenges Facing Wheat Production: The Strategic Research Agenda of the Global Wheat Initiative. *Agronomy* **12**, 2767
5. **Rebetzke GJ**, Zhang H, Ingvordsen C, Condon AG, Rich S, Ellis M (2022) Genotypic variation and covariation in wheat seedling seminal root architecture and grain yield under field conditions. *Theoretical and Applied Genetics* **135**, 3247-3264
6. Ingvordsen C, Hendriks P, Smith D, Bechaz KM, **Rebetzke GJ** (2022) Genetic differences in maximal wheat rooting depth with different *Rht* dwarfing genes. *Journal of Experimental Botany* (Accepted 28 June 2022)
7. Nelson M, Nesi N, Barrero JM, Fletcher AL, Greaves IK, Hughes T, Laperche A, Snowden, **Rebetzke GJ**, Kirkegaard JA (2022) Strategies to improve field establishment of canola: a review. *Advances in Agronomy* **175**, 133-177
8. Hendriks PW, Gurusinghe S, Ryan P, **Rebetzke GJ**, Weston L (2022) Competitiveness of early vigour winter wheat (*Triticum aestivum* L.) genotypes is established at early growth stages. *Agronomy* **12**, 377
9. **Rebetzke GJ**, Rattey AR, Brooks B, Bovill W, Richards RA, Ellis MH (2022) Agronomic assessment of the durum *Rht18* dwarfing gene in bread wheat. *Crop and Pasture Science* **73**, 325-336
10. Zhao Z, Wang E, Kirkegaard J, **Rebetzke GJ** (2022) Novel wheat varieties facilitate deep sowing to beat the heat of changing climates. *Nature Climate Change* **12**, 291-296
11. Hendriks PW, Ryan PR, Hands P, Rolland V, Gurusinghe S, Weston LA, **Rebetzke GJ**, Delhaize E (2022) Selection for early shoot vigour in wheat increases root hair length but reduces epidermal cell size of roots and leaves. *Journal of Experimental Botany* **73**, 2499-2510
12. **Rebetzke GJ**, Rathjen T (2021) Dwarfing gene near-isogenic stocks for assessing plant height and agronomic performance in bread wheat. *Field Crops Research* (Embargoed under Commercial in Confidence)
13. Flohr BM, Ouzman J, McBeath TM, **Rebetzke GJ**, Kirkegaard JA, Llewellyn RS(2021) Spatial analysis of the seasonal break and implications for crop establishment in southern Australia. *Agricultural Systems* **190**, Article ID 103105
14. Deery D, **Rebetzke GJ**, Jimenez-Berni J, James R, Bovill WD, Furbank R, Condon AG, Chapman SC (2021) LiDAR improves phenotypic repeatability of above-ground biomass and crop growth rate in wheat. *Plant Phenomics* Article ID 8329798
15. Deery D, **Rebetzke GJ**, Jimenez-Berni J, James R, Bovill WD, Furbank R, Condon AG, Chapman SC (2021) Impact of varying light and dew on canopy ground cover measured from ground-based LiDAR, NDVI and RGB in wheat. *Plant Phenomics.* Article ID 9842178
16. Verbyla AP, Faveri JD, Deery DM, **Rebetzke GJ** (2021) Modelling temporal genetic and spatio-temporal residual effects for high-throughput phenotyping data. *Australia and New Zealand Journal of Statistics* **63**, 284-308
17. Francki M, Stainer GS, Walker E, **Rebetzke GJ**, Stefanova K, French RJ (2021) Phenotypic evaluation and genetic analysis of seedling emergence in a global collection of wheat genotypes (*Triticum aestivum* L.) under limited water capacity. *Frontiers of Plant Science* p. 2851
18. Houshmandfar A, Ota N, O’Leary GN, Rebetzke GJ, Tauz M (2020) A reduced tillering trait show small but consistent yield gains in dryland wheat production. *Global Change Biology* 26, 4056-4067
19. Dreccer FM, Condon AG, Macdonald B, **Rebetzke GJ**, Awasi MA, Borgognone MG, Peake A, Piñera-ChavezFJ Hundt A, Jackway, P, McIntyre CL (2020) Genotypic variation for lodging tolerance in spring wheat: Wider and deeper root plates, a feature of low lodging, high yielding germplasm. *Field Crops Research* **258**, Article ID 107942
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**Invited Industry talks**

1. **Rebetzke G** et al. (2023) Seed traits – an update of research and development. *GRDC Research Updates Bendigo, Adelaide, Dubbo*
2. Green T, Moroni S, Harris F, Pratley J, Mullan D, **Rebetzke G** (2023) Winter-sown 100-day wheats for a changing Australian climate. *Wagga Wagga GRDC Updates*
3. **Rebetzke G** (2022) Keeping rain affected grain for seed. *GRDC Research Update*, *National online*
4. **Rebetzke G**, Kirkegaard J, McBeath T, Stummer B, Flohr B, Fletcher A, Rich S, Lamond M, Haskins B, Whitworth R, Bechaz K (2022) Early learnings from multi-site, multi-system assessment of new long-coleoptile genetics for deep sowing of wheat. *GRDC Research Updates Murray Bridge, Adelaide*
5. Flohr B, McBeath T, Ouzman J, Davoren B, Shoobridge W, **Rebetzke G**, Ballard R, Peck D, Llewellyn R, Kirkegaard J, Stummer B (2022) Adaptive sowing strategies to overcome a shifting seasonal break. *Adelaide Grains Research Update*
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9. **Rebetzke G**, Ingvordsen CH, Spielmeyer W, French B, Zaicou-Kunesch C, Fettell N (2019) New genetics to improve wheat establishment and weed competitiveness. *GRDC Research Update Perth*
10. **Rebetzke G** (2019) Breeding for climate change. *GRDC Grains Research Update, Wagga Wagga*
11. **Rebetzke G**, *Understanding the impact of heat in breeding improved tolerance to high temperatures in wheat* Northampton, 2018
12. **Rebetzke G**, Ingvordsen C, Newman P, Weston LA, French B, Gill G (2018) Delivering weed-competitive, wheat breeding lines to growers. *GRDC Grains Research Update, Wagga Wagga*
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14. **Rebetzke G**, Fettell N (200??) Breeding for greater yield under drought. *GRDC Grains Rsearch Update, Wagga Wagga*
15. **Rebetzke G**, Condon AG, Richards RA, Fettell N (2008) Breeding for greater water-use efficiency in wheat. *GRDC Grains Research Update, Wagga Wagga*

**Patents/Plant Varieties/Germplasm Delivered to Breeding Companies**

*Commercial varieties*

1. ‘LRPB Bale’ (Aust. Premium White, slow spring awnless wheat variety with potential as hay in frost-regions) <https://www.longreachpb.com.au/product/bale/>
2. ‘LRPB Dual’ (Aust. Hard, mid-quick awnless wheat variety with potential as hay in frost-regions) <https://www.longreachpb.com.au/product/dual/>
3. ‘EGA Drysdale’ (high transpiration, Aust Hard, mid-quick wheat variety)
4. ‘EGA Rees’ (high transpiration, Aust Prime Hard, mid-quick wheat variety)

*Wheat germplasm (Material Transfer Agreements to breeding companies)*

1. 100-day, high biomass topcross wheats in multiple genetic backgrounds (all breeding companies)
2. Awnless topcross advanced breeding lines (all breeding companies)
3. Awnless NILs in six modern genetic backgrounds (all breeding companies)
4. Reduced tillering × high early vigour backcross wheats in multiple genetic backgrounds (CIC)
5. High grain protein Suntop/Spitfire RILs (CIC)
6. Long coleoptile, *Rht1/2* and *Rht13* NILs in multiple genetic backgrounds (all breeding companies)
7. Long coleoptile, *Rht1/2* and *Rht18* NILs in multiple genetic backgrounds (all breeding companies)
8. Weed-competitive, high vigour topcross breeding lines (all breeding companies)
9. High root biomass topcross lines (CIC)
10. Halberd NILs varying for 10 GA-insensitive and GA-sensitive dwarfing genes (all breeding companies)
11. Reduced-tillering advanced breeding lines (CIC)
12. Transpiration-efficient NILs (tails) in four genetic backgrounds (GRDC)

*Soybean germplasm*

1. High oleic, low linolenic acid soybean germplasm: N98-4445A (Registration no. 162) (Crop Science Society of America)
2. Reduced palmitic, high oleic acid soybean germplasm: N94-2575 (Registration no. GP-261) (Crop Science Society of America)
3. Reduced palmitic acid soybean germplasm: C1943 (Registration no. GP-262) (Crop Science Society of America)

**Published media-style commentaries** (not peer reviewed)

1. Podcast ‘Improving crop establishment with long coleoptile wheat (GRDC, July 2022)

<https://grdc.com.au/news-and-media/audio/podcast/improving-crop-establishment-with-long-coleoptile-wheat>

1. Video: ‘Breeding wheat for a changing climate’ (GRDC, February 2020)

<https://www.youtube.com/watch?v=mbFnHkh4uwE>