CURRICULUM VITAE

YUAN CHAI

GEMS Informatics Center
University of Minnesota, Twin Cities
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St Paul, MN 55108

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EDUCATION

University of Minnesota, Twin Cities
Ph.D. in Applied Economics 2018
M.S. in Plant Pathology 2011
Tsinghua University, Beijing, China
B.S. in Biological Science and Biotechnology 2008

ACADEMIC POSITION

Co-Director, International Science and Technology Practice and Policy (InSTePP) center, Department of Applied Economics, University of Minnesota, Twin Cities 2023-present

Adjunct Assistant Professor, Department of Applied Economics, University of Minnesota, Twin Cities 2023-present

Applied Economist, GEMS Informatics Center, College of Food, Agricultural and Natural Resource Sciences, University of Minnesota, Twin Cities 2019-present

RESEARCH INTERESTS

Agricultural risk management; Production economics; Bio-economic modeling; Agricultural R&D; Food security

RESEARCH EXPERIENCE

University of Minnesota, Twin Cities
GEMS Agro-Informatics Initiative
Agro-economist Researcher 2019-present
Postdoctoral Research Fellow 2018-2019
International Science and Technology Policy and Practice Center, Department of Applied Economics
Graduate Student Research Assistant 2012-2018

Steffenson Laboratory, Department of Plant Pathology
Lab Technician 2010-2012
Graduate Student Research Assistant 2008-2010
Tsinghua University, Beijing, China
Department of Biological Science and Biotechnology
Undergraduate Research Assistant 2007-2008

PUBLICATIONS:

Chai, Y., D. J. Pannell, and P. G. Pardey. 2023. "Nudging farmers to reduce water pollution from nitrogen fertilizer." *Food Policy* 120:102525.

Chai, Y., P.G. Pardey, and K.A.T. Silverstein. 2022. "Scientific selection: A century of increasing crop varietal diversity in US wheat." *Proceedings of the National Academy of Sciences* 119(51):e2210773119.

Chai, Y., S. Senay, D. Horvath, and P. Pardey. 2022. "Multi-peril pathogen risks to global wheat production: A probabilistic loss and investment assessment." Frontiers in Plant Science 13:1034600.

Senay, S.D., P.G. Pardey, **Y. Chai**, L. Doughty, and R. Day. 2022. "Fall armyworm from a maize multi-peril pest risk perspective." Frontiers in Insect Science 2:971396

Kusunose, Y., J.J. Rossi, D.A. Van Sanford, P.D. Alderman, J.A. Anderson, **Y. Chai**, M.K. Gerullis, S.V.K. Jagadish, P.A. Paul, J.B. Tack, and B.D. Wright. 2022. "Sustaining productivity gains in the face of climate change: A research agenda for US wheat." *Global Change Biology* 00:1–9.

Chai, Y., P.G. Pardey, T.M. Hurley, S.D. Senay, and J.M. Beddow. 2020. "A Probabilistic Bio-Economic Assessment of the Global Consequences of Wheat Leaf Rust." *Phytopathology*, 110(12):1886–1896.

Chai, Y., P.G. Pardey, C. Chan-Kang, J. Huang, K. Lee, and W. Dong. 2019. "Passing the Food and Agricultural R&D Buck? The United States and China." *Food Policy*, 101729.

Dehmer, S.P., Pardey, P.G., Beddow, J.M. and **Chai, Y.** 2019. "Reshuffling the Global R&D Deck, 1980-2050". *PloS One*, 14(3), p.e0213801.

Cheng, A., **Chai, Y.**, and Wang, J. 2017. "Spillover Effect of Oil Price Volatility on China's Commodities Futures Market". *Journal of Northwestern Polytechnical University*, Xi'an. (2). (in Chinese)

Steffenson, B.J., A.J. Case, Z.A. Pretorius, V. Coetzee, F.J. Kloppers, H. Zhou, **Y. Chai**, R. Wanyera, G. Macharia, S. Bhavani, and S. Grando. 2017. "Vulnerability of Barley to African Pathotypes of *Puccinia graminis* f. sp. *tritici* and Sources of Resistance." *Phytopathology* 107(8):950–962.

Chai, Y., D.J. Kriticos, J.M. Beddow, N. Ota, T. Yonow, and W.S. Cuddy. 2016. "*Puccinia triticina* (Wheat Leaf Rust)." St. Paul, MN: InSTePP-HarvestChoice.

Gill, U., R. Brueggeman, J. Nirmala, **Y. Chai**, B. Steffenson, and A. Kleinhofs. 2016. "Molecular and genetic characterization of barley mutants and genetic mapping of mutant *rpr2* required for *Rpg1*-mediated resistance against stem rust." *Theoretical and Applied Genetics* 129(8):1519–1529.

Beddow, J.M., P.G. Pardey, **Y. Chai**, T.M. Hurley, D.J. Kriticos, H.-J. Braun, R.F. Park, W.S. Cuddy, and T. Yonow. 2015. "Research investment implications of shifts in the global geography of wheat stripe rust." *Nature Plants* 1(10):15132.

Beddow, J.M., R.W. Sutherst, D.J. Kriticos, E. Duveiller, and **Y. Chai**. 2015. "*Puccinia graminis* (Wheat Stem Rust)." St. Paul, MN: InSTePP-HarvestChoice.

Chai, Y., D.J. Kriticos, J.M. Beddow, E. Duveiller, W.S. Cuddy, T. Yonow, and R.W. Sutherst. 2015. "Puccinia striiformis (Wheat Stripe Rust)." St. Paul, MN: InSTePP-

HarvestChoice.

Chai, Y., and J. Beddow. 2014. "Wheat Stem Rust Vulnerability." In K. Sebastian, ed. *Atlas of African Agriculture Research and Development: Revealing Agriculture's Place in Africa*. Washington, D.C.: International Food Policy Research Institute (IFPRI), pp. 60–61.

Steffenson, B.J., H. Zhou, **Y. Chai**, and S. Grando. 2013. "Vulnerability of Cultivated and Wild Barley to African Stem Rust Race TTKSK." In G. Zhang, C. Li, and X. Liu, eds. *Advance in Barley Sciences*. Dordrecht, Netherlands: Springer, pp. 243–255

Chai, Y., J. Nirmala, A. Kleinhofs, and B. Steffenson. 2012. "Failure of RPG1 protein to degrade in high-copy Rpg1 transgenic barley lines results in susceptibility to stem rust." *Physiological and Molecular Plant Pathology* 80:10–18.

UNDER REVIEW & WORKING PAPERS

Senay, S., T.M. Hurley, P.G. Pardey, **Y. Chai** and A. Joglekar. 2022. "Global Multi-Peril Pest Risk Assessment for Maize and Wheat." In progress.

Chai, Y., and P.G. Pardey. 2022. "Risk Types and the Demand for Crop Insurance: A Case Study of U.S. Wheat". In progress.

PRESENTATIONS

Chai, Y., K. Silverstein, and P. Pardey. Agro-Biodiversity: The Spatio-Temporal Dynamics of U.S. Wheat Varieties. *Minnesota Supercomputing Institute Research Exhibition, April 28, 2020*

Chai, Y., Pannell, D., and Pardey, P., Hurley, T. Harnessing Flat Payoff Functions for Nitrogen Fertilizer to Address Water Pollution. *AARES (Australasian Agricultural & Resource Economics Society) Annual Meeting, February 15, 2019*

Chai, Y., Pardey, P., and Huang, J. Passing the Food and Agricultural R&D Buck? The United States and China. *22nd ICABR Conference - Disruptive Innovations, Value Chains, and Rural Development, Washington DC, USA, June 15, 2018*

Chai, Y., The Impacts of Biotic and Abiotic Risks on the Demand for Crop Insurance. *Doctoral Dissertation Fellowship Showcase, University of Minnesota, April 11, 2017*

Chai, Y., Microbe Effects on Global Food Security: A Spatio-Temporal Perspective on Wheat Rust Diseases. *Healthy Foods, Heathy Lives Summit, Minneapolis, October 27, 2016*

Chai, Y., Modeling Economics of Pest and Disease Damage and Management. *Advancing Pest and Disease Modeling Workshop, February 23-25, Gaineville, FL, 2015*

Chai, Y., The Global Occurrence and Economic Consequences of Stripe Rust in Wheat. *Department of Plant Pathology, University of Minnesota, February 16, St. Paul, MN*, 2015

Chai, Y., Crop Risk Management: R&D investment & Crop Insurance. *China Agricultural University, August 4, Beijing, China;* and *Inner Mongolia University, August 5, Hohhot, China*, 2014

Chai, Y., Steffenson, B., Nirmala, J., and Kleinhofs, A. Highly expressed RPG1 protein in a five-copy *Rpg1*-transgenic barley line results in susceptibility to stem rust. *Borlaug Global Rust Initiative 2011 Technical Workshop, Saint Paul, Minnesota*, 2011

TEACHING EXPERIENCE

GEMS Informatics Center, CFANS, University of Minnesota, Twin Cities
GEMS X003 Introduction to Data Analysis in R, **Instructor** 2023; 2022
GEMS X003 Spatial Data Analysis in R, **Co-Instructor** 2023; 2022

Department of Applied Economics, University of Minnesota, Twin Cities
APEC 8222 Big Data Methods in Economics, **Guest Lecturer** Fall 2021

School of Business Administration, Zhongnan University of Economics and Law, Wuhan, Hubei Province, China
R for Applied Economics Short Course, **Instructor** Summer 2019

Department of Applied Economics, University of Minnesota, Twin Cities
APEC 8601 Natural Resource Economics, **TA** Fall 2016
Introduction to Numerical Analysis Software, **Instructor** Summer 2016

Department of Plant Pathology, University of Minnesota, Twin Cities
CFANS 3001 Pests and Crop Protection, **TA** Spring 2010

AWARDS

MSI Research Exhibition Finalist Award, University of Minnesota 2020
Doctoral Dissertation Fellowship, University of Minnesota 2016-2017
Hueg Harrison Fellowship, CFANS, University of Minnesota 2014
HarvestChoice Research assistantship, University of Minnesota 2012-2015
MN Agricultural Experiment Station (MAES) Research Assistant 2008-2010
Winner of Competitive Graduate Student Symposium at Borlaug Global Rust Initiative (BGRI) Technical Workshop, St. Paul, MN 2011
Scholarship in recognition of Academic Excellence, Tsinghua University, Beijing 2006
Freshman scholarship, Tsinghua University, Beijing 2004

COMPUTER SKILLS

R; Python; STATA; MATLAB; Mathematica; ArcGIS; QGIS; CLIMEX; DSSAT

LANGUAGE SKILLS

Mandarin Chinese (Native); English (Fluent)

(Last updated May 08, 2023)