

CURRICULUM VITAE

Dr. Gregory D. Graff

Department of Agricultural & Resource Economics
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EDUCATION

2002 Ph.D., Agricultural and Resource Economics, University of California Berkeley
1999 M.S., Agricultural and Resource Economics, University of California Berkeley
1995 M.A., Slavic and East European Studies, Ohio State University
1992 B.A., Biological Sciences, Cornell University

ACADEMIC POSITIONS

2018 - present Professor, Agricultural and Resource Economics, Colorado State University, Fort Collins, Colorado, USA.
2011 - 2018 Associate Professor, Agricultural and Resource Economics, Colorado State University, Fort Collins, Colorado, USA.
2015 - 2016 Visiting Professor, Technology Management and Economics, Chalmers University of Technology, Gothenburg, Sweden.
2007 - 2011 Assistant Professor, Agricultural and Resource Economics, Colorado State University, Fort Collins, Colorado, USA.
2004 - 2007 Senior Research Associate and Program Director, Public Intellectual Property Resource for Agriculture (PIPRA), Department of Plant Sciences, University of California, Davis, California, USA.
2004 - 2007 Visiting Research Fellow, Department of Agricultural and Resource Economics, University of California, Berkeley, California, USA.

SABBATICALS

2015 - 2016 Department of Technology Management and Economics, Division of Entrepreneurship and Strategy, Chalmers University of Technology, Gothenburg, Sweden.

OTHER POSITIONS

- 2003 - 2004 Director of Research, Bio Economic Research Associates LLC (bio-era), Cambridge, MA.
- 2001 - 2003 Senior Analyst, Office of Technology Transfer, University of California, Office of the President, Oakland, CA.

INSTITUTE/PROGRAM AFFILIATIONS

- 2016 - present Faculty Affiliate, Food Systems, Colorado State University (<http://foodsystems.colostate.edu/people/faculty-affiliates/>)
- 2016 - present Research Associate, Regional Economic Development Institute (REDI), Colorado State University (<http://redi.colostate.edu/bios-and-contact/>)
- 2009 - present GDPE Faculty, Graduate Degree Program in Ecology (GDPE), Colorado State University, Colorado State University (<http://www.ecology.colostate.edu/faculty-list.aspx>)
- 2008 - present InSTePP Fellow, International Science and Technology Practice and Policy (InSTePP), University of Minnesota (<http://www.instepp.umn.edu/about-us/people/instepp-fellows>)

CURRENT JOB DESCRIPTION

40% Teaching, 50% Research/Creative Activity, 10% Service/Outreach

CURRENT WORKING PAPERS

1. Per Hulthen and Gregory Graff, "Migration of venture-capital funded startups" Chalmers University of Technology, November 2019.
2. Gregory Graff et al, "Control and Access: Intellectual property and CRISPR-Cas gene editing for innovation in crop agriculture," proceedings from OECD/USDA sponsored conference, Keystone, CO, October 24-25, 2019.
3. Yoo-Hwan Lee and Gregory Graff, "Empirical Estimation of University Knowledge Production" Colorado State University, January 2018.

PUBLISHED WORKS

Books

1. Anatole Krattiger, Richard Mahoney, Lita Nelson, Jennifer Thompson, Alan Bennett, Kanikaram Satyanarayana, Gregory Graff, Carlos Fernandez, and Stanley Kowalski, Eds., 2007, Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices, Volumes 1 and 2, Oxford, UK: MIHR and Davis, CA: PIPRA, 1998 pages. (Full open access online at <http://www.iphandbook.org/>)

Refereed Journal Articles

1. Gregory Graff and Jacob Sherkow, “Models of technology transfer for genome-editing technologies,” *Annual Review of Genomics and Human Genetics*, Vol. 21 (August 2020), pp. 509-534.
2. Gregory Graff and Philip Pardey, “Inventions and patenting in Africa: Empirical trends from 1970 to 2010” *Journal of World Intellectual Property*, 23(1-2), (March 2020), pp. 40-64.
3. Knut Egelie, Gregory Graff, Sabina Strand, and Berit Johansen, “The Emerging Patent Landscape of CRISPR/Cas Gene Editing Technology: Early views on control and access for follow-on commercial applications” *Nature Biotechnology*, 34(10), (October 2016), pp. 1025-1031.
4. Liaw Batan, Gregory Graff, and Thomas Bradley, “Techno-economic and Monte Carlo probabilistic analysis of microalgae biofuel production system,” *Bioresource Technology*, 219, (2016), pp. 45–52.
5. Steven Albers, Annabelle Berklund, and Gregory Graff, “The Rise and Fall of Innovation in Biofuels: the global landscape of biofuel patenting from 1970 to 2013,” *Nature Biotechnology*, 34(8), (August 2016), pp. 814-821.
6. David Jefferson, Gregory Graff, Cecilia Chi-Ham and Alan Bennett, “The Emergence of Agbiogenetics,” *Nature Biotechnology* Vol. 33, (August 2015) pp. 819–823.
7. Gregory Graff, Gal Hochman, Chubashini Suntharlingam, and David Zilberman, “The Competing Policy Paradigms of Agricultural Biotechnology: Implications and Opportunities for Emerging and Developing Economies,” *AgBioForum*, (August 2015).
8. David Zilberman, Gregory Graff, Gal Hochman and Scott Kaplan, “The political economy of biotechnology,” *German Journal of Agricultural Economics*, Volume 64 (2015), Number 4, pp. 212-223.
9. Chubashini Suntharalingam, Shanmugavelu Sithambaram, Gregory Graff, and Nor Azlina Saari, “Characterizing Innovation in the Livestock Industry: A Malaysian Case” *International Journal of Tropical Agriculture*, Vol. 33, No. 2, (April-June 2015), pp. 879-885.
10. David Zilberman, Scott Kaplan, Eunice Kim, Gal Hochman, and Gregory Graff, “Continents Divided: Understanding Differences between Europe and North America in Acceptance of GM Crops,” *GM Crops and Food*, 4(3), (July-December 2013), pp. 202-208.
11. Gregory Graff, Devon Phillips, Zhen Lei, Sooyoung Oh, Carol Nottenburg, & Philip Pardey, “Not Quite a Myriad of Gene Patents,” *Nature Biotechnology* Vol. 31, (May 2013) pp. 404-410.
12. Tania Bubela, Richard Gold, Gregory Graff, Daniel Cahoy, Dianne Nicol, David Castle, “Patent Landscaping for Life Sciences Innovation: Toward Consistent and Transparent Practices” *Nature Biotechnology*, Vol. 31, (March 2013) pp. 202-206.
13. Debra Mathews, Gregory Graff, Krishanu Saha, and David Winickoff, “Access to Stem Cells and Data: Persons, Property Rights, and Scientific Progress,” *Science*, Vol. 331. (11 February 2011), pp. 725-727.
14. Gregory Graff, David Zilberman, and Alan Bennett, “The Commercialization of Biotechnology Traits,” *Plant Science*, 179, (2010) pp. 635-644.
15. Gregory Graff, David Zilberman, and Alan Bennett, “The Contraction of Agbiotech Product Quality Innovation,” *Nature Biotechnology*, Vol. 27, No. 8 (August 2009), pp. 702-704.
16. Gregory Graff, Gal Hochman, and David Zilberman, “The Political Economy of Agricultural Biotechnology Policies,” *AgBioForum*, Vol. 12, No. 1 (2009), pp. 34-46.
17. David Winickoff, Kris Saha, and Gregory Graff, “Opening Stem Cell Research: A Policy Proposal for the Management of Data, Intellectual Property, and Ethics,” *Yale Journal of Health Law, Policy and Ethics*, Vol. IX, No. 1 (Winter 2009), pp. 52-127.
18. Karl Bergman and Gregory Graff, “The Global Stem Cell Patent Landscape: Implications for Efficient Technology Transfer and Commercial Development” *Nature Biotechnology*, Vol. 25, No. 4 (April 2007), pp. 419-425.

19. Gregory Graff, David Roland-Holst, and David Zilberman, "Biotechnology and Poverty Reduction in Low-Income Countries," *World Development*, Vol. 34, No. 8 (2006): 1430-1445.
20. David Zilberman and Gregory Graff "Intellectual Property Rights, Innovation, and the Evolution of Biotechnology in Developing Countries," *Quarterly Journal of International Agriculture*, Vol. 44, No. 3 (2005), pp. 247-266.
21. David Zilberman, Holly Ameden, Gregory Graff, and Matin Qaim, "Agricultural Biotechnology: Productivity, Biodiversity, and Intellectual Property Rights," *Journal of Agricultural & Food Industrial Organization*, Vol. 2, No. 2 (2004), Article 3.
22. Gregory Graff, Brian Wright, Alan Bennett, and David Zilberman, "Access to Intellectual Property: an Obstacle to Developing Transgenic Horticultural Crops," *California Agriculture*, (April-June 2004), pp. 121-126.
23. Gregory Graff, "Observing Technological Trajectories in Patent Data: Empirical Methods to Study the Emergence and Growth of New Technologies," *American Journal of Agricultural Economics*, Vol. 85, No. 5 (2003), pp. 1266-1274.
24. Deborah Delmer, Carol Nottenburg, Gregory Graff, and Alan Bennett, "Intellectual Property Resources for International Development in Agriculture," *Plant Physiology*, Vol. 133 (2003), pp.1666-1670.
25. Gregory Graff, Susan Cullen, Kent Bradford, David Zilberman, and Alan Bennett, "The Public-Private Structure of Intellectual Property Ownership in Agricultural Biotechnology," *Nature Biotechnology*, Vol. 21, No. 9 (September 2003), pp. 989-995.
26. Gregory Graff, Gordon Rausser, and Arthur Small, "Agricultural Biotechnology's Complementary Intellectual Assets," *Review of Economics and Statistics*, Vol. 85, No. 2 (May 2003), pp. 349-363.
27. Gregory Graff, Amir Heiman, and David Zilberman, "University Research and Offices of Technology Transfer," *California Management Review*, Vol. 45, No. 1 (Fall 2002), pp. 89-115.
28. Gregory Graff and David Zilberman, "An Intellectual Property Clearinghouse for Agricultural Biotechnology," *Nature Biotechnology*, Vol. 19 (December 2001), pp. 1179-1180.

Refereed Chapters in Books:

1. Gregory D. Graff, Felipe de Figueiredo Silva, and David Zilberman, "Venture capital and the transformation of private R&D for agriculture," in *The Economics of Agricultural Research and Innovation*, P. Moser, Ed., National Bureau of Economic Research (NBER), 2021.
2. Ghulam Samad and Gregory Graff, "The urban concentration of innovation and entrepreneurship in agricultural and natural resource industries," in *Urban Studies and Entrepreneurship: How can cities foster Entrepreneurship?* M. Iftikhar, J. Justice, & D. Audretsch, Eds., Springer, 2020.
3. Gregory Graff, Gal Hochman, Chubashini Suntharlingam, and David Zilberman, "The Competing Policy Paradigms of Agricultural Biotechnology: Implications and Opportunities for Emerging and Developing Economies," in *Biotechnology for a Second Green Revolution in India*, N.C. Rao, C. Pray, & R. Herring, Eds., Academic Foundation, 2018.
4. Monica Alandete-Saez, Cecilia Chi-Ham, Gregory Graff, Sara Boettiger and Alan B. Bennett, "Intellectual Property in Agricultural Biotechnology: Strategies for Open Access" in *Plant Biotechnology and Genetics: Principles, Techniques, and Applications*, 2nd Edition, N. Stewart, Ed., Wiley: 2016, pp. 347-365.
5. Gregory Graff and David Zilberman, "How the 'Regulatory-IP' complex affects incentives to develop socially beneficial products from agricultural genomics" in E. Marden, N. Godfray, R. Manion, Eds., *Innovation in Agricultural Genomics: Overcoming Complexities in the Intellectual Property-Regulatory Complex*, University of British Columbia Press, 2015.

6. Gregory Graff, David Zilberman, and Gal Hochman, “The political economy of technology regulation in the face of creative destruction: the case of agricultural biotechnology,” in R. Herring, Ed., *Handbook of Food, Politics, and Society*, Oxford University Press, 2015.
7. Monica Alandete-Saez, Cecilia Chi-Ham, Gregory Graff, and Alan Bennett, “Intellectual Property in Agriculture,” in N. Van Alfen, Ed., *Encyclopedia of Agriculture and Food Systems*, Elsevier, 2014.
8. Derek Eaton and Gregory Graff, “The dynamic IP system in crop genetics and biotechnology,” Chapter 28 in S.J. Smyth, P.W.B. Phillips, and D. Castle, Eds., *Handbook on Agriculture, Biotechnology, and Development*, Edward Elgar, 2013.
9. Gregory Graff, Gal Hochman, David Zilberman, “The research, development, commercialization, and adoption of drought and stress tolerant crops,” in N. Tuteja and S. Gill, *Crop Improvement under Adverse Conditions*, New York: Springer Science + Business Media, 2013, pp. 1-34.
10. Gregory Graff and David Zilberman, "Agricultural Biotechnology: Equity and Prosperity," in J. Popp, M. Jahn, M. Matlock, N. Kemper, Eds. *The Role of Biotechnology in a Sustainable Food Supply*, Cambridge University Press, 2012.
11. Gregory Graff, “¿Ecos de la Ley Bayh-Dole? Un Estudio de las Políticas de PI y de Transferencia de Tecnología en las Economías Emergentes y en Desarrollo,” in Anguita, Diaz, Chi-Ham, et al. Eds., *Gestion de la Propiedad Intelectual e Innovacion en Agricultura y en Salud*, Fundacion para la Innovacion Agraria (FIA) and PIPRA: Davis, CA. 2010.
12. Alan B. Bennett, Cecilia Chi-Ham, Gregory Graff, and Sarah Boettiger, “Intellectual Property in Agricultural Biotechnology: Strategies for Open Access” in N. Stewart, Ed., *Plant Biotechnology and Genetics: Principles, Techniques, and Applications*, New York: J. Wiley & Sons, 2008.
13. Gregory Graff and David Zilberman, “The Political Economy of Intellectual Property: Re-Examining European Policy on Plant Biotechnology” in J. Kesan, Ed., *Seeds of Change: Intellectual Property Protection for Agricultural Biotechnologies*, Wallingford, UK: CABI Press, 2007.
14. Karl Bergman and Gregory Graff, “Collaborative IP management for stem cell R&D: Lessons learned from agricultural biotechnology” in *Intellectual Property and Bioscience*, Stuttgart/Berlin: Steinbeis-Edition, 2007.
15. Gregory Graff, “Echoes of Bayh-Dole: A Survey of Intellectual Property and Technology Transfer Policies in Emerging and Developing Economies” in A. Krattiger, R. Mahoney, L. Nelsen, et al, Eds., *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices*, MIHR: Oxford, UK and PIPRA: Davis, CA. 2007.
16. Martha Mutschler and Gregory Graff, “Introduction to Intellectual Property Issues in the University Setting: A Primer for Scientists” in A. Krattiger, R. Mahoney, L. Nelsen, et al, Eds., *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices*, MIHR: Oxford, UK and PIPRA: Davis, CA. 2007.
17. Gregory Graff and Alan Bennett, “Intellectual Property and Technology Transfer by the University of California Agricultural Experiment Station” in A. Krattiger, R. Mahoney, L. Nelsen, et al, Eds., *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices*, MIHR: Oxford, UK and PIPRA: Davis, CA. 2007.
18. Gregory Graff, “Regulation of Transgenic Crops Intended for Pharmaceutical and Industrial Uses” in J. Alston, R. Just, and D. Zilberman, Eds., *Regulating Agricultural Biotechnology: Economics and Policy*, New York: Springer, 2006.
19. Gregory Graff, David Roland-Holst, and David Zilberman, “Agricultural Biotechnology and Globalization: U.S. Experience with Public and Private Sector Research” in J.H.H. Wesseler, Ed., *Environmental Costs and Benefits of Transgenic Crops*, Dordrecht: Springer, 2005.

20. Gregory Graff and David Zilberman, "Towards an Intellectual Property Clearinghouse for Agricultural Biotechnology," in J. Cooper, L. Lipper, and D. Zilberman, Eds., *Agricultural Biodiversity and Biotechnology in Economic Development*, New York: Springer, 2005.
21. Alain de Janvry, Gregory Graff, Elisabeth Sadoulet, and David Zilberman, "Technological Change in Agriculture and Poverty Reduction: The Potential Role of Biotechnology" in J. Cooper, L. Lipper, and D. Zilberman, Eds., *Agricultural Biodiversity and Biotechnology in Economic Development*, New York: Springer, 2005.
22. Gregory Graff, Matin Qaim, Cherisa Yarkin, and David Zilberman, "Agricultural Biotechnology in Developing Countries," in C.G. Scanes and J.A. Miranowski, Eds., *Perspectives in World Food and Agriculture*, Ames, Iowa: Iowa State Press, 2004.
23. Sara Boettiger, Gregory Graff, Philip Pardey, Eric Van Dusen, and Brian Wright, "Intellectual Property Rights for Plant Biotechnology: International Aspects," in P. Christou and H. Klee, Eds., *The Handbook of Plant Biotechnology*, Chichester: John Wiley & Sons Ltd., 2004.
24. Gregory Gaff, Amir Heiman, David Zilberman, Federico Castillo, Douglas Parker, "Universities, Technology Transfer, and Industrial R&D," in R.E. Evenson, V. Santaniello, and D. Zilberman, Eds., *Economic and Social Issues in Agricultural Biotechnology*, Wallingford: CABI, 2002.

Refereed Proceedings/Transactions

1. Gregory D. Graff and Intan Hamdan-Livramento, *Global Roots of Innovation in Plant Biotechnology*, Economic Research Working Paper No. 59, World Intellectual Property Organization (WIPO), November 2019.
2. Chan, Sarah, Gregory Graff, Kazuto Kabo, Debra J.H. Mathews, Alan Regenberg, Douglas Sipp, and David Winickoff. *Statement on Data and Materials Sharing and Intellectual Property in Pluripotent Stem Cell Science in Japan and China*. Hinxtion Group Asia, Kobe, Japan, January 2012.
3. Chan, Sarah, Peter J Donovan, Ruth Faden, John Harris, Robin Lovell-Badge, Debra JH Mathews, Alan Regenberg, Julian Savulescu, David Winickoff, Robert Cook-Deegan, Gregory Graff, Aurora Plomer, Kris Saha, Christopher Scott, John Sulston, and Patrick Taylor. *Statement on Policies and Practices Governing Data and Materials Sharing and Intellectual Property in Stem Cell Science*. Hinxtion Group, November 2010.
4. Sean O'Connor, Gregory Graff, and David Winickoff, *Legal Context of University Intellectual Property and Technology Transfer*, National Academies of Science, Science Technology Economics and Policy (STEP) Board, September 2010.

Non-Refereed Journal Articles/Chapters/Proceedings/Transactions:

1. Gregory Graff, Karl Bergman, Alan Bennett, and David Zilberman, "Intellectual Property Clearinghouses as an Institutional Response to the Privatization of Innovation in Agriculture," *African Technology Development Foundation Journal*, Vol. 3, No. 3, Fall 2006.
2. Gregory Graff and GianCarlo Moschini, "Pharmaceutical and Industrial Products in Crops: Economic Prospects and Impacts," *Iowa Ag Review*, Vol. 10, No. 4, Fall 2004, pp. 4-5, 11.
3. Gregory Graff and David Zilberman, "Explaining Europe's Resistance to Agricultural Biotechnology," *Agricultural and Resource Economics Update*, Vol. 7, No. 5, May 2004, pp. 1-4.

4. Gregory Graff, Amir Heiman, Cherisa Yarkin, and David Zilberman, “Privatization and Innovation in Agricultural Biotechnology,” *Agricultural and Resource Economics Update*, Vol. 6, No. 4, March-April 2003, pp. 5-7.
5. Gregory Graff and David Zilberman. “Towards an Intellectual Property Clearinghouse for Agricultural Biotechnology,” *IP Strategy Today*, No. 3, 2001, pp. 1-13.

Other (e.g. lab texts, book reviews, technical reports, in-house reports):

1. Dawn Thilmany, Becca Jablonski, and Gregory Graff, *The Colorado Blueprint of Agriculture and Food*, Colorado State University, Fort Collins, CO, 2019.
2. Gregory Graff, Annabelle Berklund, and Kathay Rennels, *The Emergence of an Innovation Cluster in the Agricultural Value Chain Along the Colorado Front Range*, Colorado State University, Fort Collins, CO, November 2014.
3. Patrick Byrne, Dustin Pendell, and Gregory Graff, “Labelling of Genetically Modified Foods,” Fact Sheet No. 9.371, Colorado State University Extension, Fort Collins, CO, October 2014.
4. Gregory Graff, Ryan Mortenson, Rebecca Goldbach, et al, *The Value Chain of Colorado Agriculture*, Department of Agricultural and Resource Economics and the Office of Engagement, Colorado State University, Fort Collins, CO, February 2013.
5. Jennifer Bond and Gregory Graff, book review of “GA Alsos, S. Carter, E. Ljunggren, and F. Welter (eds.), *The Handbook of Research on Entrepreneurship in Agriculture and Rural Development*. Northampton: Edward Elgar Publishing, Inc. 320 pp., (2012)” in *Agribusiness*, Volume 28, Issue 1, Winter 2012, pp. 118–120.
6. Gregory Graff, David Zilberman, and Alan Bennett, *Nutritional and Product Quality Innovations in Agricultural Biotechnology: A new generation of crop traits and their potential economic impacts*, Public Intellectual Property Resource for Agriculture (PIPRA), Davis, CA (April 2008), 142 pages.
7. Karl Bergman and Gregory Graff, *Collaborative IP Management for Stem Cell Research and Development*, Center of Intellectual Property Studies (CIP), Gothenberg, Sweden, and the Public Intellectual Property Resource for Agriculture (PIPRA), Davis, CA (December 2006), 46 pages.
8. Gregory Graff, *The Impact of Blocking Patents on Innovation in Soy Genetics*, report for the United Soybean Board/American Soybean Association, St. Louis, MO (July 2005), 62 pages.
9. Ann Bublitz and Gregory Graff, *Crop Biomanufacturing Part II: Implications for the Farm Sector*, Bio Economic Research Associates (bio-era), Cambridge, MA (January 2004), 14 pages.
10. Gregory Graff, *Crop Biomanufacturing Part I: Economic Opportunities for the Biotechnology Industry*, Bio Economic Research Associates (bio-era), Cambridge, MA (January 2004), 36 pages.
11. Gregory Graff and James Newcomb, *Agricultural Biotechnology at the Crossroads: the Changing Structure of Industry*, Bio Economic Research Associates (bio-era), Cambridge, MA (February 2003), 26 pages.

CONTRACTS & GRANTS

Externally-Funded Projects as PI

- | | |
|-------------|--|
| 2020 – 2022 | Research Intergovernmental Personnel Agreement (IPA), United States Patent and Trademark Office, \$82,680. |
| 2019 – 2020 | Venture capital funded agricultural innovation in the U.S. and abroad, USDA-ERS-Economic Research Service Cooperative Agreement, \$23,973. |

- 2019 - 2021 Intellectual Property on CRISPR and the Gene Editing of Crops for Sustainable Agriculture, USDA, National Institutes of Food and Agriculture (NIFA), \$44,887.
- 2018 - 2019 Intellectual Property and Access to CRISPR-Cas Gene Editing Technologies for Innovation in Crop Agriculture, OECD, Co-operative Research Programme (CRP), Trade and Agriculture Directorate, €28,215.
- 2018 - 2020 Venture Capital and the Transformation of Private R&D for Agriculture and Food, National Bureau of Economic Research (NBER), joint with David Zilberman, University of California Berkeley, \$6,000.
- 2013 - 2014 Incentives for Agricultural Innovation in Emerging and Developing Economies: Understanding National Intellectual Property Policies in a Global Context, International Food Policy Research Institute (IFPRI), \$15,274.

Externally-Funded Projects as CoPI

- 2017 - 2021 Root Genetics in the Field to Understand Drought Adaptation and Carbon Sequestration, with PI John McKay, co-PI on Technology to Market, ARPA-E, U.S. Department of Energy, \$8.3 million. (Interdisciplinary between crop science and agricultural economics; role as director of “Technology to Market” strategy and economic research on potential market uptake of crops with improved root traits.)
- 2012 - 2013 The Value Chain of Colorado Agriculture, with co-PI Kathay Rennels (CSU Office of Engagement), Colorado Department of Agriculture, State of Colorado, \$50,000. (Interdisciplinary; lead data compilation and authorship of report on the structure of the state’s agricultural and food industry; informing economic development strategy of the Colorado Office of Economic Development and International Trade and the Governor of Colorado)
- 2009 - 2013 International Assessments of Patenting in Genetics, with Co-PI Philip Pardey (University of Minnesota), National Institutes of Health, \$1.4 million. (Interdisciplinary between agricultural economics, intellectual property law, public policy, and biology; as Co-PI, I led the data collection and data analysis efforts, and authorship of main publications.)
- 2009 - 2011 Technological and Agricultural Entrepreneurship for a Globally Sustainable Future, with co-PIs Anthony Marchese (CSU, Mechanical Engineering) and Paul Hudnut (CSU, Management), National Collegiate Inventors and Innovators Association (NCIIA), \$49,900. (Interdisciplinary course development project between engineering, business, and agricultural economics; each co-PI shared equally in experimental course development and teaching load for the two semesters that the experimental course was offered.)
- 2010 - 2011 Designing a Technology-Neutral Benefit Pricing Policy for the Electric Power Sector in Colorado, with Co-PIs Terry Iverson (CSU) and Catherine Keske (CSU), Governor’s Energy Office, State of Colorado, \$93,177. (Disciplinary; I advised on strategy and content, with only a minor role in writing.)
- 2009 - 2010 Legal Context of University Intellectual Property (IP) and Technology Transfer, with Co-PIs Sean O’Connor (University of Washington) and David Winickoff (University of California Berkeley), National Academies of Science, Board on Science, Technology,

and Economic Policy (STEP) and Committee on Science, Technology, and Law (CSTL), \$4,500. (Interdisciplinary between economics, policy, and law; played supporting role in research and authoring report.)

2007 - 2010 Intellectual Property Protection and Contractual Relations for Biofuels Innovations, with PI Brian Wright (University of California Berkeley), Energy Bioscience Institute (EBI), \$318,000.

Externally-Funded Projects as Investigator or role other than PI or CoPI

2013 - 2016 PACE-'Omics: Personalized, Accessible, Cost-Effective applications of 'Omics technologies, with PIs Christopher McCabe (University of Alberta) and Tania Bubela (University of Alberta), external collaborator, Genome Canada, CAD\$8.9 million. (Interdisciplinary between biology, public policy, and economics; played minor advisory role, attended and presented at workshops.)

2009 - 2011 Harnessing the Sun for On-farm Fertilizer Production, with PI Jessica Davis (CSU), Western Sustainable Agricultural Research and Extension (WSARE), US Department of Agriculture, \$159,023. (Interdisciplinary between soil science, microbiology, and agricultural economics; played supporting role analyzing market potential and advised a graduate student team recruited from the Global Social and Sustainable (GSSE) MBA program in the College of Business assigned to develop a marketing strategy for the technology.)

Externally-Funded Pending Projects as Investigator or role other than PI or CO-PI

2017 - 2021 Putting Waste to Work: Enabling Adoption of Organic Soil Amendments for Improved Agricultural Water Use Efficiency (126240), with PI Rich Conant (CSU), National Science Foundation (INFEWS/T3), \$3.0 million.

Internally-Funded Awards

2020 - 2023 Soil Carbon Solutions Center (SCSC), Center for Innovative Partnerships (CIP) initiative of CSU Vice President for Research, with PI Keith Paustian.

2017 - 2018 Strategic Insights into the Regional Network of Agricultural Technology Innovators in Colorado, CSU Vice President for Research Quarterly Funding, CSU Ventures, College of Agricultural Sciences, Department of Agricultural and Resource Economics.

2016 - 2017 Colorado Food Blue Print: Opportunities for Colorado's Food System, with Co-PIs Dawn Thilmany and Becca Jablonski, CSU College of Agricultural Sciences, \$116,000.

2015 - 2017 Innovation Center for Sustainable Agriculture (ICSA), Center for Innovative Partnerships (CIP) initiative of CSU Vice President for Research, with PI Matt Wallenstein.

2013 - 2014 Characterizing Colorado's Emergent Agricultural Innovation Cluster, with co-PI Kathay Rennels, CSU Chancellor's Venture Fund, CSU Ventures, and CSU College of Agricultural Sciences, total project amount \$19,625.

2008 - 2009 The Intellectual Property Landscape of Alternative Biofuel Technologies, Clean Energy SuperCluster Internal Grant, \$14,775.

Un-Funded Projects as PI or CoPI

- 2020 Creating a Masters Program in Agribusiness Entrepreneurship and Innovation Management: Higher Education in Creative Partnerships with the Business Sector, USDA-NIFA, Higher Education Challenge, \$150,000.
- 2020 Venture Capital Investment in Agricultural Innovation and Publicly Funded Agricultural Science, USDA-NIFA-National Institute of Food and Agriculture, January 1, 2021 - December 31, 2023
- 2019 Creating a Masters Program in Agribusiness Entrepreneurship and Innovation Mangement: Higher Education in Creative Partnership with the Business Sector, USDA-NIFA, Higher Education Challenge, \$150,000.
- 2018 Creating a Masters Program in Agribusiness Entrepreneurship and Innovation Mangement: Higher Education in Creative Partnership with the Business Sector, USDA-NIFA, Higher Education Challenge, \$150,000.
- 2016 Economic Potential of Industrial Hemp in the U.S., Industrial Hemp Research Foundation, \$245,700.
- 2015 The Economics of Universities and Intellectual Property in the Knowledge Economy, Mobility for Regional Excellence, Vastra Gotaland Region, Sweden, 1.6 million Swedish krona (SEK)
- 2015 The role of the research university in fostering commercial innovation and entrepreneurship, with co-PI Mats Lundqvist (Chalmers University of Technology), Ewing Marion Kauffman Foundation, \$65,000.
- 2014 Universities and Intellectual Property in the Knowledge Economy and Innovation Management by Student Entrepreneurs, Fulbright Scholar Program, 2015-16 U.S. Scholar Application, \$22,950.
- 2013 Efficacy of translating genomic research to innovations in a global IP environment, with Co-PI Philip Pardey (University of Minnesota), National Institutes of Health, \$1.9 million.
- 2013 Universities and Intellectual Property in the Knowledge Economy and Innovation Management by Student Entrepreneurs, Fulbright Scholar Program, 2014-15 U.S. Scholar Application, \$22,950.
- 2012 Integrating Bibliometrics and Econometrics to Evaluate the Economic Consequences of Research: with Application to the Food and Agricultural Sciences, with Co-PIs Matt Anderson (University of Wyoming) and Philip Pardey (University of Minnesota), Science of Science and Innovation Policy (SciSIP), National Science Foundation, \$787,714.

PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/PROFESSIONAL MEETINGS/WORKSHOPS

1. Gregory Graff, Felipe De Figueiredo Silva, and David Zilberman, “Venture Capital and the Transformation of Private R&D for Agriculture and Food,” invited departmental seminar, Agricultural and Resource Economics, North Dakota State University, Fargo, ND (via ZOOM), January 22, 2021.
2. Gregory Graff, “Intersections of Venture Capital, Intellectual Property, and Innovation in Agriculture,” invited presentation for the Intellectual Property Committee of the American Seed Trade Association (ASTA), January 14, 2021.
3. Gregory Graff, “Intellectual Property as a Governance Mechanism for Genome Editing in Agriculture and Food,” invited presentation for conference on Gene Editing in Agriculture and Food: Social Concerns, Public Engagement and Governance, Iowa State University, October 20-21, 2020.
4. Intan Hamdan-Livramento and Gregory Graff, “Global Roots of Innovation in Plant Biotechnology,” presentation at ICABR Virtual Conference, October 15, 2020.
5. Gregory Graff, Felipe De Figueiredo Silva, and David Zilberman, “Venture Capital and the Transformation of Private R&D for Agriculture and Food,” invited presentation for session on “Studying Innovation in Agriculture – New data and tools,” ASSA, San Diego, January 3, 2020.
6. Gregory Graff, “Intellectual property and CRISPR-Cas gene editing for innovation in crop agriculture,” invited seminar, Innovative Genomics Institute, University of California Berkeley, December 3, 2019.
7. Gregory Graff, “Innovation and the Value Chain of Agriculture and Food,” invited talk for Colorado Farm Bureau 2019 Annual Meeting, Denver, CO, November 22, 2019.
8. Gregory Graff, “The CRISPR patent race: Intellectual property and CRISPR-Cas gene editing for innovation in crop agriculture,” invited video keynote lecture for Genetics 4.0 - CRISPR Revolution / Genética 4.0 - Revolução CRISPR, Escola Superior de Agricultura Luiz de Queiroz, University of São Paulo, Piracicaba, Brasil, 13 November 2019.
9. Gregory Graff, “Control and Access: Intellectual property and CRISPR-Cas gene editing for innovation in crop agriculture,” invited keynote address 2nd Annual Genome Editing Symposium, Texas A&M University, 3 October 2019.
10. Gregory Graff, “The Economics of CRISPR: Factors governing the application of gene editing in the agricultural value chain,” ARBL/Physiology/Biomedical Sciences seminar, College of Veterinary Medicine, Colorado State University, September 23, 2019.
11. Gregory Graff, “Trends in Innovation and the Value Chain of Agriculture and Food,” invited panel presentation, German/American Chamber of Congress Agritech Symposium, Denver, CO, September 19, 2019.
12. Gregory Graff, “Trends in Innovation and the Value Chain of Agriculture and Food,” invited keynote address for the Colorado Water Congress 2019 Summer Conference, Steamboat Springs, CO, August 20-22, 2019.
13. Gregory Graff, “Venture Capital and the Transformation of Private R&D for Agriculture and Food,” invited keynote lecture for International Association of Milk Control Agencies, 2019 Annual Meeting, Golden, Colorado, August 14, 2019.
14. Gregory Graff, Felipe De Figueiredo Silva, and David Zilberman, “Venture Capital and the Transformation of Private R&D for Agriculture and Food,” invited chapter for *Economics of Agricultural Research and Innovation*, National Bureau of Economic Research (NBER), Washington DC, May 17, 2019
15. Gregory Graff, “Controlling CRISPR: Intellectual property and governance of the collaborative technology platform for genome editing,” invited presentation to the Working Group on Bio-, Nano-,

- and Converging Technologies, Organisation for Economic Co-operation and Development (OECD), Paris, 16 May 2019.
16. Gregory Graff, Felipe De Figueiredo Silva, and David Zilberman, “Venture Capital Funding for Agricultural Innovation,” *Innovation in Agrifood Supply Chains: Finance, Profitability, and Sustainability*, Solidaridad and University of California Berkeley’ Berkeley, CA, April 10-11, 2019.
 17. Gregory Graff, “Innovation networks and clusters in agricultural biotechnology,” invited presentation for workshop on *Geography of Innovation: Local Hotspots, Global Networks*, World Intellectual Property Organization (WIPO), Geneva, Switzerland, February 25, 2019.
 18. Gregory Graff and Ghulam Samad, “The Urban Concentration of Innovation and Entrepreneurship in Agricultural and Natural Resource Industries,” 65th Annual North American Meetings of the Regional Science Association International (RSAI), North American Regional Science Council (NARSC), San Antonio, TX, November 7, 2018
 19. Gregory Graff, Felipe De Figueiredo Silva, and David Zilberman, “Venture Capital and the Transformation of Private R&D for Agriculture and Food,” *Economics of Agricultural Research and Innovation*, National Bureau of Economic Research (NBER), Cambridge, MA, November 8, 2018
 20. Gregory Graff, “IP Control of CRISPR: Implications for Development of Agricultural and Food Applications,” Pioneer Policy Lecture Series, Iowa State University, August 27, 2018.
 21. Gregory Graff, “IP Control of CRISPR: Implications for Development of Agricultural and Food Applications,” Presidential Invited Paper, AAEA Annual Meetings, Washington DC, August 6, 2018.
 22. Ghulam Samad and Gregory Graff, “The Urban Clustering of Innovation for Rural Industries: Biotechnologies for Agriculture, Energy, and Natural Resources” Western Agricultural Economics Association (WAEA) Annual Meetings, Anchorage, AK, June 20, 2018.
 23. Gregory Graff, “The Economics of CRISPR: Factors governing the application of gene editing in the agricultural value chain,” International Consortium on Applied Bio-Economy Research (ICABR), The World Bank, Washington DC, June 12-15, 2018.
 24. Gregory Graff, “Energy and Agriculture: How dependence of agriculture on energy inputs poses the biggest opportunities for innovation,” UC Davis Innovation Summit, Innovation Institute for Food and Health, University of California Davis, April 23, 2018.
 25. Gregory Graff, “Controlling CRISPR: Factors governing the application of gene editing in the agricultural value chain,” *Innovation in Agrifood Supply Chains: People-Planet-Profit*, University of California Berkeley, April 18-19, 2018.
 26. Yoo Hwan Lee and Gregory Graff, “Empirical Estimation of University Knowledge Production Functions for Knowledge Outputs Disseminated via Multiple Channels,” ASSA Annual Meetings, Philadelphia, January 7, 2018
 27. Gregory Graff, “Entrepreneurship in Agricultural Technology,” invited panel presentation for symposium on *Research and Innovation Policies for Sustainable Productivity Growth in Agriculture*, Farm Foundation, USDA-ERS, and OECD, The National Press Club, Washington, DC, September 19-20, 2017.
 28. Gregory Graff and David Zilberman, “Intellectual Property and Regulatory Issues of Gene Editing in Agriculture and Food: Lessons of GMOs for CRISPR Gene Editing,” 2017 AAEA Annual Meeting, Chicago, IL, August 1, 2017
 29. Gregory Graff, “Controlling CRISPR: How the rapidly changing patent and regulatory environment may affect commercial applications of genome editing,” invited keynote address for Rocky Mountain Food Safety Conference, Denver, CO, May 24, 2017.
 30. Gregory Graff, “Innovation and Regulatory Impact of Gene Modification vs. Gene Editing of Food and Crops” invited panel presentation at conference *Planting the Seed 2017*, hosted by Barnes and Thornburg LLP, Indianapolis, IN, May 23 2017.

31. Gregory Graff and David Zilberman, "Not Your Mother's GMOs: Intellectual Property and Regulatory Issues of Gene Editing in Agriculture and Food," Presented at NC-1034 conference Impact Analyses and Decision Strategies for Agricultural Research, University of Arizona, Tucson, AZ, February 25, 2017.
32. Gregory Graff, "The Rise and Fall of Innovation in Biofuels: the global landscape of biofuel patenting from 1970 to 2013" invited paper presentation at conference The Bioeconomy: Technological and Policy Path Forward, Rutgers University, New Brunswick, NJ, October 1, 2016.
33. Gregory Graff, "The Emerging Patent Landscape of CRISPR-Cas Gene Editing Technology," comments presented at the Workshop on Gene Editing in an International Context: Scientific, Economic, and Social Issues across Sectors, Working Party on Biotechnology, Nanotechnology, and Converging Technologies, OECD, Ottawa, Canada, September 29-30, 2016.
34. Gregory Graff, "The Emerging Patent Landscape of CRISPR-Cas Gene Editing Technology," invited panel presentation at the CIP Forum 2016, Center for Intellectual Property (CIP), University of Gothenburg, Gothenburg, Sweden, September 27 2016.
35. Jakrapun Suksawat & Gregory Graff, "Potential Impact of Cropping-pattern and Land-use Changes from the Thai Ethanol Production Mandate on the Environment" selected paper presentation at the East Asian Association of Environmental and Resource Economics 2016 Congress (EAAERE 2016), August 7-10, 2016, Kyushu Sangyo University, Fukuoka, Japan.
36. Gregory Graff, "The Rise and Fall of Innovation in Biofuels: the global landscape of biofuel patenting from 1970 to 2013" invited seminar at Department of Economics and Management of Enterprises, Faculty of Economic Sciences, Warsaw University of Life Sciences (SGGW), Warsaw, Poland, April 7, 2016
37. Gregory Graff, "Patenting in Sub-Saharan Africa and implications for knowledge-driven economic development" invited seminar, College of Law, University of New Hampshire, March 25 2016.
38. Gregory Graff and Yoo Hwan Lee, "The Inner Workings of University Knowledge Production and its Impacts on Commercial Innovation: Empirical Evidence from Colorado State University 1989-2012," Technology Management and Economics Seminar, Chalmers University of Technology, Gothenburg, Sweden, December 3, 2015.
39. Gregory Graff, speaker for panel on "How Will We Nourish our Planet in the Face of Projected Population Growth?" Global Grand Challenges: CSU Research and Translation," National Press Club, Washington, D.C., June 11, 2015.
40. Yoo Hwan Lee and Gregory Graff, "University Research Productivity and its Impact on the Regional Agricultural Economy: The Case of Colorado State University and the Colorado Economy," invited poster presentation, 2015 AAEEA/WAEA Annual Meetings, San Francisco, CA, July 27, 2015.
41. Gregory Graff, Devon Phillips, Philip Pardey, "Innovation in the Bioeconomy," DARE Research Seminar, March 26, 2015.
42. Gregory Graff, "The Business of Sustainably Feeding a World of 9 Billion," invited presentation for panel on The Business of Feeding the World, 2014 International Colloquium, Visions of Future Earth: Linking Society, Economics, and the Environment, Lory Student Center, Colorado State University, October 6-8, 2014
43. Gregory Graff, Devon Phillips, Philip Pardey, "Innovation in the Bioeconomy," invited paper presentation for Australian Agricultural & Resource Economics Society (AARES) Organized Symposium, "Innovation in the Agricultural Bioeconomy: Implications for Yield, Market Concentration, and Regulations in the Crop Sector," at the 2014 AAEEA Annual Meetings, Minneapolis, MN, July 28, 2014.
44. Gregory Graff, Devon Phillips, Philip Pardey, "Innovation in the Bioeconomy," paper presented at NC1034 conference "Pests, Germs and Seeds: The Economics of Policies, Programs, and

- Technologies for Managing Agricultural Pests and Diseases,” University of California Davis, March 28, 2014.
45. Gregory Graff, “The Impact of the U.S. Supreme Court’s AMP v. Myriad decision across industries: The changing landscape of U.S. gene patents,” invited presentation for Congressional Advisory Workshop “The Future of Gene Patents: Making Sense of the Supreme Court’s Decision in the Myriad Case,” Rayburn House of Representatives Office Building, Washington DC, March 13, 2014.
 46. Gregory Graff, Devon Phillips, Philip Pardey, “Innovation in the Bioeconomy,” invited papers presentation for Australian Agricultural & Resource Economics Society (AARES) Annual Meetings, Port Macquarie, NSW, Australia, 7 February 2014.
 47. Gregory Graff, Devon Phillips, Philip Pardey, et al, “Not Quite a Myriad of Gene Patents: The Changing Landscape of U.S. Patents that Claim Isolated Nucleic Acids,” NC1034 Conference, Biotechnology Trade and Transfer: Barriers and Opportunities, University of Arizona, Tucson, AZ, March 15, 2012.
 48. Gregory Graff, Devon Phillips, Philip Pardey, et al, “Global Patenting Trends in the Genetic Sciences 1970-2010: A First Look at the INSTEPP Global Genetics Patent Database,” Canadian Science Policy Conference, Calgary, Alberta, Canada, November 6, 2012.
 49. Gregory Graff, Cecilia Chi-Ham, Mark Szczerba, and Alan Bennett, “The Emergence of Agbiogenetics: Implications for the Future of Crop Genetic Improvement,” invited presentation at the American Agricultural Law Association (AALA) 2012 Annual Meetings, Nashville, TN, October 20, 2012.

TEACHING

Year	Semester	Course No./Title	Cr. Hrs.	Enrollment
2021	Spring	AGRI/IE 270 - World Interdependence*	3	56
2021	Spring	AREC 478 - Agricultural Policy	3	36
2020	Spring	AGRI/IE 270 - World Interdependence*	3	70
2020	Spring	AREC 478 - Agricultural Policy	3	36
2020	Spring	AREC 505 - Economics of Production†	3	5
2019	Spring	AGRI/IE 270 - World Interdependence*	3	50
2018	Fall	AREC 705 - Economics of Production†	2	5
2018	Spring	AGRI/IE 270 - World Interdependence*	3	50
2018	Spring	AREC 478 - Agricultural Policy	3	36
2017	Spring	AGRI/IE 270 - World Interdependence*	3	50
2017	Spring	AREC 478 - Agricultural Policy	3	36
2016	Fall	AREC 705 - Economics of Production†	2	5
on sabbatical Fall 2015 - Spring 2016 at Chalmers University of Technology, Gothenburg, Sweden				
2015	Spring	AGRI/IE 270 - World Interdependence*	3	90
2015	Spring	AREC 705 - Economics of Production†	2	5
2014	Fall	AREC 478 - Agricultural Policy	3	36
2014	Spring	AREC 478 - Agricultural Policy	3	36
2014	Spring	AGRI/IE 270 - World Interdependence*	3	90
2013	Fall	AREC 478 - Agricultural Policy	3	36
2013	Spring	AGRI/IE 270 - World Interdependence*	3	90
2013	Spring	AREC 705 - Economics of Production†	2	8
2012	Fall	AREC 478 - Agricultural Policy	3	36
2012	Fall	ECOL 592 - Ecology seminar: Innov policy	1	6
2012	Spring	AGRI/IE 270 - World Interdependence*	3	90
2011	Fall	AREC 478 - Agricultural Policy	3	36
2011	Spring	AGRI/IE 270 - World Interdependence*	3	90
2011	Spring	AREC 566 - Contemp Issues in Dev Countries	3	10
2011	Spring	MECH/AREC 581A2 - Tech Entrepreneurship‡	3	14
2010	Fall	AREC 478 - Agricultural Policy	3	36
2010	Spring	AREC 478 - Agricultural Policy	3	36
2010	Spring	AGRI/IE 270 - World Interdependence*	3	90
2010	Spring	MECH/AREC 581A2 - Tech Entrepreneurship‡	3	33 (+7)
2009	Fall	AREC 478 - Agricultural Policy	3	36

*AGRI/IE 270 - World Interdependence: Population and Food has the following attributes:

- Interdisciplinary: The course is cross-listed between the College of Agricultural Sciences (AGRI) and International Education (IE). Within the AGRI portion of the course, material is drawn from agricultural economics, international trade, and agricultural policy, soil and crop sciences, animal sciences, water resources, and more.
- International: Listed as International Education and fulfilling AUCC 3E “global and cultural awareness” requirements, the course looks at world agriculture as a global system and surveys issues of global food security through a framework of global food demand and global food supply.
- GT Pathways: The course includes a significant writing component.
- Service Learning: About half of the students enrolled select an option to volunteer with a local food assistance program during the duration of the semester, in order to better understand hunger and food insecurity problems within the local community.
- Service: Students enroll in this course from across the university, with an average of 30 different majors; less than 20% of the students with majors in the College of Agricultural Sciences.

† AREC 705 - Economics of Production, a Ph.D. field course, is team taught. I am responsible for 50%, teaching a one-credit module on “Advanced Topics in the Economics of Technological Change”.

‡ MECH/AREC 581A2 - Technology Entrepreneurship for Scientists and Engineers was an experimental course developed under a grant from the National Collegiate Inventors and Innovators Association (NCIIA). The course was interdisciplinary, organized by three faculty, one each from the College of Engineering (Anthony Marchese, Dept of Mechanical Engineering), the College of Agricultural Sciences (myself), and the College of Business (Paul Hudnut, Dept of Management). I was responsible for 33%, giving one third of the lectures, but all three of us attended all of the session throughout the semester. Topics ranged from business strategy, to intellectual property, to industrial design. Students completed a team-based term project of writing a startup business plan for commercializing a real technology from their research lab at CSU. An extensive set of outside speakers, consisting of entrepreneurial faculty with startup firms from all over the university, made the course very engaged and high-visibility across campus.

STUDENT ADVISING/GRADUATE SUPERVISION

GRADUATE STUDENTS:

Current Graduate Advisees:

Aaisha Al Maamari, Ph.D., Agricultural and Resource Economics

Duoyu Wang, Ph.D., Agricultural and Resource Economics

Sarah Blandon, Ph.D., Graduate Degree Program in Ecology (GDPE), with field in Agricultural and Resource Economics

Current Graduate Committee Memberships (excluding those chaired):

Buddy Holbert, Ph.D., Systems Engineering, Colorado State University. Advisor: Jean Piccoud.

Per Hulthein, Ph.D., Technology Management and Economics, with field in Entrepreneurship and Strategy, Chalmers University of Technology. Advisor: Mats Lundqvist.

Elbahlul Bdawi, Ph.D., Graduate Degree Program in Ecology, with field in Agricultural and Resource Economics, Colorado State University. Advisor: Dana Hoag.

Maged Elhemri, Ph.D., Graduate Degree Program in Ecology, with field in Economics, Colorado State University. Advisor: Robert Cling.

Annabelle Berklund, Ph.D., Economics, Colorado State University. Advisor: Stephan Weiler.

Graduate Degrees Completed Under Supervision:

Ghulam Samad, Ph.D., Graduate Degree Program in Ecology (GDPE), with field in Agricultural and Resource Economics, Colorado State University, August 2020.

Ahmed Alzahrani, M.S. (Plan B), Agricultural and Resource Economics, Colorado State University, August 2020.

Angelique Giraud, M.S. (Plan A), Agricultural and Resource Economics, Colorado State University, August 2019.

Bo Heiden, Ph.D., Technology Management and Economics, with field in Entrepreneurship and Strategy, Chalmers University of Technology, December 2017.

Leana Schwartz, M.Ag. (Plan B), Peace Corps Masters International (PCMI) program, with field in Agricultural and Resource Economics, August 2017.

Yoo Hwan Lee, Ph.D., Agricultural and Resource Economics, Colorado State University, August 2016.

Paouya Madani, M.S., Chalmers School of Entrepreneurship, Chalmers University of Technology, June 2016.

Joakim Olsson, M.S., Chalmers School of Entrepreneurship, Chalmers University of Technology, June 2016.

Robert Smolander, M.S., Chalmers School of Entrepreneurship, Chalmers University of Technology, June 2016.

Neama Lariel, Ph.D., Graduate Degree Program in Ecology, with field in Agricultural and Resource Economics, Colorado State University, August 2015.

Natalia Lukicheva, M.S., Agricultural and Resource Economics, Colorado State University, May 2015.

Jakrapun Suksawat, Ph.D., Graduate Degree Program in Ecology, with field in Agricultural and Resource Economics, Colorado State University, August 2015.

Chuba Suntharlingam, Ph.D., Graduate Degree Program in Ecology, with field in Agricultural and Resource Economics, Colorado State University, August 2014.

Kanokkon Pattarachon, M.S., Agricultural and Resource Economics, Colorado State University, August 2013.

OTHER ACTIVITIES/ACCOMPLISHMENTS – TEACHING/ADVISING

Masters of Agribusiness and Food Innovation Management. Designed for professionals from a variety of academic, business, and personal backgrounds, this intensive program will develop the suite of creative and business skills needed to drive innovation and development of new enterprises in today’s agricultural and food industries. This in-person degree program will be offered at Colorado State University’s new Spur campus, located at the National Western Center in Denver, beginning in Fall 2022. It will be an intensive, full-time, 16-month experience.

Through a combination of coursework, active networking, and practical experience, the program will provide training and hands-on experience in developing and launching new products, technologies, and businesses. Students will engage in coursework that will immerse them in:

- The inner workings and latest developments of the agricultural and food system
- Essential business topics including accounting, finance, intellectual property, and regulatory compliance

Students will also gain hands-on, real-world experience through a unique, integrative, team-based, business development practicum project. Students will choose one of two practicum tracks. In both tracks, student teams are paired with external partners who are active innovators in science or industry. And they are guided through the practicum by CSU faculty, advisors, and entrepreneur-in-residence mentors.

- Venture creation track—Students form a team of 3 or 4 members to help analyze a new business prospect or invention made by their external partner, develop a business plan, seek to raise capital, and prepare to launch a startup to commercialize the idea.
- Corporate partner track— Students form a team of 3 or 4 members to engage with an existing company in something like a consulting role, to help analyze and develop an innovation within that company’s current offerings or as a possible new line of business.

The practical, hands-on nature of this program offers opportunities for students to meet their career goals in a variety of ways. In some cases, students may be successful in launching a startup out of their practicum project and could take a financial stake and even a leadership role in the new company. In other cases, students and their corporate partners may find there is an excellent fit for further employment at the company after their practicum project is complete. In all cases, students will launch from this program into the professional world with new relationships, skills, and knowledge that will make them highly competitive innovators and entrepreneurs in today’s rapidly evolving agriculture and food industries.

USDA Faculty Exchange Program (FEP). With PI Bill Spencer (CSU) and Co-PI John Olienyk (CSU, College of Business). I served for several years—from 2012 until the program at CSU ended in 2015—as a faculty mentor to program participants from the Ukraine, Kazakhstan, and other former Soviet countries. This international professional development program annually hosted 4 to 6 early-career faculty members from post-Soviet countries for the Fall semester at CSU, to observe courses in agribusiness, agricultural economics, business management, finance, and marketing, and to learn about the workings of U.S. agricultural industry. Each Spring semester, a team of faculty members from CSU would travel to the home country and home institutions of each of the participants from the previous semester, in order to follow up with them, their supervisors, and their senior administration, in order to help advance their career development.

CV SECTION 4: Evidence of Outreach/Service

COMMITTEES

University Committee, year(s)

- 2020 - present Committee on Innovation Strategies (CIS), Office of Vice-President of Research
- 2016 - present CoSRGE, Faculty Council and Graduate School
- 2012 - 2014 Value Chain of Colorado Agriculture research and engagement team, Agriculture and Food key industry task force for the Colorado Blue Print, CSU Office of Engagement

College Committee, year(s)

- 2016 - present National Western Center agricultural innovation initiatives
- 2014 - 2017 CSU Agricultural Innovation Summit steering committee
- 2012 - 2015 External Advisory Board Member, Global Social and Sustainable Enterprise (GSSE) program, College of Business
- 2010 - 2011 Search committee, Bioenergy cluster hire, chaired by Lee Sommers

Department Committee, year(s)

- 2019 – present DARE Diversity Committee
- 2015 - 2016 Ag Policy PhD Field Exam Committee
- 2009 - 2014 Microeconomics PhD Core Exam Committee
- 2013 - 2014 Graduate Admissions Committee
- 2012 - 2013 Graduate Curriculum Review Committee
- 2011 - 2012 Search committee, ag production position
- 2011 - 2012 NIFA Review Research Committee
- 2009 - 2010 Awards Committee

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Clearly differentiate editorial positions (e.g. journal editor/associate editor) from manuscript and grant refereeing.

Memberships in professional societies

- 1999 - present American Applied Economics Association (AAEA)
- 1999 - present American Economics Association (AEA)
- 2000 - 2011 Association of University Technology Managers (AUTM)

2000 - 2003 Licensing Executives' Society (LES)

Service to professional societies

2018 - present Selected Presentations Committee, AAEEA

2017 Advisory Committee, Convening on Innovation Adoption Across the Food Chain, FFAR

2013 - 2015 Outstanding MS Awards Committee, AAEEA

Grant review panels

2018 - 2019 Genome Canada, 2019 Large-Scale, Agricultural Research Project Competition, Pre-Application Review Committee

2014 - 2015 Genome Canada, 2014 Large-Scale, Agricultural Research Project Competition, Full Application Review Committee

Grant proposal reviews

2017 National Science Foundation

Manuscript refereeing

2018 *Journal of Entrepreneurship and Environmental Management*

USDA Economic Research Service report

Agricultural Economics

Australian Journal of Grape and Wine Research

Journal of Agricultural and Resource Economics (JARE)

2017 USDA Economic Research Service report

2016 *Journal of International Trade & Economic Development*

2015 *Nature Biotechnology*

Applied Economic Perspectives and Policy (AEPP)

German Journal of Agricultural Economics

Colorado Department of Agriculture draft bill on Ag Innovation Grants

2014 *International Journal of Technology Transfer and Commercialization*

Environment and Development Economics

Choices

2013 *American Journal of Agricultural Economics (AJAE)*

Genome Medicine

OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

Special service to the state/community related to professional expertise

The Blueprint of Colorado Agriculture and Food.

In 2018, an update and expansion of the previous Value Chain Study was completed, this time organized by Dawn Thilmany, and done in collaboration with Becca Jablonski and others in the new Food Systems group in the Department of Agricultural and Resource Economics, funded and led by the College of Agricultural Sciences.

Formal presentations of the Blue Print have been made to the following groups:

Dawn Thilmany, Becca Jablonski, Gregory Graff, “The Blueprint of Colorado Agriculture,” Denver Startup Week, September 24 2018

Dawn Thilmany, Becca Jablonski, Gregory Graff, “The Blueprint of Colorado Agriculture,” Morgan County Economic Development Council, Fort Morgan, CO, September 24 2018

Dawn Thilmany, Becca Jablonski, Gregory Graff, “The Blueprint of Colorado Agriculture,” Governors Ag Forum, Denver, CO, February 21, 2018

Dawn Thilmany, Becca Jablonski, Gregory Graff, “The Blueprint of Colorado Agriculture,” Southern Rocky Mountain Agriculture Conference, February 7, 2018

Dawn Thilmany, Becca Jablonski, Gregory Graff, “The Blueprint of Colorado Agriculture,” CSU Agricultural Innovation Summit, September 2017

Gregory Graff, “The Value Chain of Colorado Agriculture,” invited presentation at Colorado Agricultural Water Alliance, Colorado Corn, Greeley, CO, June 19, 2017

Gregory Graff, “The Value Chain of Colorado Agriculture,” invited keynote presentation at the Colorado Farm Bureau’s Legislative and Leadership Summit, March 21, 2017

Gregory Graff, “The Value Chain of Colorado Agriculture,” invited keynote presentation for the 2017 Governor’s Ag Forum, Denver, CO, February 22, 2017.

Value Chain of Colorado Agriculture. In 2011 Kathay Rennels, AVP of Engagement, CSU, convened a group of faculty to discuss a critical gap for including agriculture as a designated key industry under Governor John Hickenlooper’s new “Colorado Blueprint” economic development initiative. To facilitate that statewide policy process, CSU was tasked by the Governor’s office, the Office of Economic Development and International Trade (OEDIT), and Colorado Department of Agriculture (CDA) to convene Agriculture and Food key industry working groups, and undertake a unique analysis of the value chain of the agricultural and food industry within the state of Colorado.

Formal presentations of the Value Chain study were made to the following groups:

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” invited presentation for conference “Is Organic Agriculture for Me?” Boulder County Parks and Open Space, Boulder, CO, April 5, 2014.

Gregory Graff, “The Value Chain of Colorado Agriculture,” International Visitors Leadership Program, WorldDenver and U.S. State Department, seminar held at Colorado State University, Fort Collins, CO, March 31, 2014.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Food and Agriculture Policy Council, Boulder County, Longmont, CO, February 20, 2014.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Pueblo Chamber of Commerce, Pueblo, CO, January 9, 2014.

Gregory Graff, “The Value Chain of Colorado Agriculture,” Greeley Chamber of Commerce, Greeley, CO, November 5, 2013.

Gregory Graff, “The Value Chain of Colorado Agriculture,” CSU Extension Forum, Colorado State University, November 7, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” University Economic Development Association (UEDA) 2012 annual meetings, Pittsburgh, PA, October 28, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Northwest Colorado Council of Governments, Dillon, CO, October 23, 2013.

Gregory Graff, “The Resource of Food Depend On: Soils,” 5th grade assembly speaker, Range View Elementary School, Severance, CO, October 14, 2013.

Gregory Graff, “The Value Chain of Colorado Agriculture,” Northern Colorado Economic Development Corp (NCEDC) and Upstate Colorado, Joint Meeting of the Boards of Directors, Loveland, CO, September 26, 2013.

Gregory Graff, “Policy Issues in the Value Chain of Colorado Agriculture,” The League of Women Voters, Fort Collins, CO, September 9, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” The Colorado 50, Burlington, CO, September 5, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Bioagricultural Science and Pest Management (BSPM) faculty retreat, Fort Collins, CO, August 23, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Region 13 Colorado Blueprint Advisory Committee, Canon City, CO, August 15, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Northeastern Colorado Economic Development Advisory (NECO), Fort Morgan, CO, July 25, 2013.

Gregory Graff, “Cultivating Innovation in the Agricultural Value Chain,” invited luncheon speaker, FCC Services, Board of Directors, Boulder, CO, July 24, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Colorado River District Board of Directors, Glenwood Springs, CO, July 16, 2013.

Gregory Graff, “The Value Chain of Colorado Agriculture,” CEDS Resource Network and Colorado Blueprint Meeting, Durango Public Library, Durango, CO, June 27, 2013.

Gregory Graff, “The Value Chain of Colorado Agriculture,” Northern Colorado Business Advisory Council (NCBAC), Greeley, CO, June 21, 2013.

Gregory Graff, “The Value Chain of Colorado Agriculture,” Kharkiv National Technical University of Agriculture of Petro Vasylenko, Kharkiv, Ukraine, 29 May 2013

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Colorado Innovation Network (COIN), Fort Collins, CO, May 16, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Colorado State Legislature, Joint House and Senate Agriculture Committees, Denver, CO, May 1, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Colorado Livestock Association Board Meeting, CSU, Fort Collins, CO, April 23, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Colorado Agricultural Leadership Program (CALP), Fort Morgan, CO, April 19, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” CSU President’s Agricultural Advisory Council, Denver, CO, April 10, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Agriculture Staff of Senator Michael Bennett, Fort Collins, CO, April 2, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Office of Economic Development and International Trade (OEDIT), Denver, CO, March 19, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Commissioner of the Colorado Department of Agriculture, Littleton, CO, March 6, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” Yampa Valley Economic Development Council, Craig, CO, February 6, 2013.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture,” CSU President’s Agriculture Advisory Council, Denver, CO, October 2012.

Colorado’s Agricultural Innovation Cluster. One of the cross-cutting economic development issues examined in the Colorado Blueprint process concerned the roll of innovation and new technology. One result that stood out in the previous Value Chain analysis was the surge in R&D activity in agriculture and food along the Front Range. This was initially presented in isolation to an industry association meeting at the Innosphere, a startup incubator in Fort Collins. The recognition of the salience of this issue led to a follow-on study funded by the CSU Chancellor’s Office in June 2013, to explore the regional economic phenomenon of an emerging innovation cluster. The final report was published in November 2014.

The Agricultural Innovation Cluster study was subsequently presented to a wide range of groups around the state in 2014 and 2015:

Gregory Graff and Kathay Rennels, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited presentation Agricultural Experiment Station Directors’ Western Region Joint Summer Meetings, Breckenridge, CO, July 7, 2015.

Gregory Graff, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” Canadian Consulate conference “A Taste of Canada,” Inverness Hotel, Englewood, CO, June 22, 2015.

Gregory Graff, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited keynote speaker, CSU Agriculture Innovation Summit: Advancing the Agriculture Economy through Innovation, March 19, 2015.

Gregory Graff, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited keynote speaker, Innovation After Hours, Rocky Mountain Innosphere, February 12, 2015.

Gregory Graff, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited presentation to Agrium/CPS/Loveland Products, Loveland, CO, January 28, 2015.

Gregory Graff and Kathay Rennels, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited presentation at CSU Partners Breakfast, National Western Stock Show, January 17, 2015.

Gregory Graff, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” invited luncheon speaker VinCO and the Colorado Horticultural Society Annual Meeting, Grand Junction, CO, January 14, 2015.

Gregory Graff and Kathay Rennels, “The Emergence of an Innovation Cluster in the Agricultural Value Chain Along Colorado’s Front Range,” presentation to Colorado Impact Fund and Vestar Capital Partners, Denver, CO, December 17, 2014

Gregory Graff and Kathay Rennels, “The Emergence of a Colorado Ag Innovation Cluster” Consultation with Agricultural Industry Association Leaders, Colorado Department of Agriculture, Broomfield, CO, October 2014.

Gregory Graff, “The Emergence of an Innovation Cluster in the Value Chain of Colorado Agriculture: Consumer Implications,” invited presentation at Consumer Issues Conference: Food Perceptions, Practices, & Policies, University of Wyoming, Laramie, WY, October 9, 2014.

Gregory Graff, “The Emergence of a Colorado Ag Innovation Cluster” invited keynote speaker, Future Seed Executives (FuSE), American Seed Trade Association, La Junta, CO, September 25, 2014.

Gregory Graff and Kathay Rennels, “The Emergence of a Colorado Ag Innovation Cluster” College of Agricultural Sciences, Dean’s Leadership Council, CSU Denver Center, September 25, 2014.

Kathay Rennels and Gregory Graff, “The Value Chain of Colorado Agriculture: Opportunities for Colorado as a center for innovation in hemp,” presentation for Agriculture Panel, Colorado Hemp Industry Symposium, hosted by U.S. Representative Jared Polis, Boulder, CO, August 20, 2014.

Kathay Rennels and Gregory Graff, “The Emergence of an Innovation Cluster in the Value Chain of Colorado Agriculture: A First Look,” Economic Development Council of Colorado, 2014 Spring Conference, Grand Junction, CO, May 1, 2014.

Tom Lipetzky, Kathay Rennels, and Gregory Graff, “Innovation in Colorado Agriculture: Looking Forward,” CSU President’s Agricultural Advisory Council, Denver, CO, November 15, 2013.

Kathay Rennels and Gregory Graff, “Characterizing Colorado’s emergent agricultural innovation cluster,” Agriculture Innovators Network, Innosphere, Ft Collins, CO, Sept 11, 2013.