

Ranae Dietzel

Postdoctoral Research Associate, Lecturer

3403 Agronomy Hall, Iowa State University, Ames, IA 50010

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Education

Iowa State University, Ames, IA 2014
Doctorate of Philosophy
Crop Production & Physiology and Sustainable Agriculture

Cornell University, Ithaca, NY 2009
Master of Science
Soil Science, Minors: Agronomy and Biogeochemistry

University of Minnesota - Morris 2006
Bachelor of Arts
Biology

Research and Teaching Experience

Iowa State University, Department of Agronomy
Graduate Faculty Associate Member 2017-present
Lecturer 2016-present
Postdoctoral Research Associate 2014-present
Graduate Research Assistant 2009-2014

Cornell University 2006-2009
Graduate Research and Teaching Assistant

USDA-Agricultural Research Service, Morris, MN May-Dec 2005
Biological Science Aid

West Central Research and Outreach Center, University of Minnesota 2003-2004
Undergraduate Research Assistant

Agro-Soyuz, Mayskoye, Ukraine Summer 2004
Veterinary Assistant

Iowa State University, Natural Resource Ecology and Management Summer 2003
Undergraduate Research Assistant

Fellowships and Grants

NIFA ELI Postdoctoral Fellowship (\$150,000, PI) 2016-2018
Leopold Center for Sustainable Agriculture Competitive Grant (\$48,000, PI) 2016-2019
Iowa Soybean Association Competitive Grant (\$80,183, co-PI) 2018-2019
Iowa Soybean Association Competitive Grant (\$230,000, co-PI) 2018-2019
Soybean Research Center Competitive Grant (\$79,805, co-PI) 2015-2017
NIFA Pre-doctoral Fellowship (\$75,000, PI) 2015-2016

Andrew W. Mellon Student Research Grant	2011-2014
Agricultural Ecology Program Mini-grant	2008
Clinton DeWitt Smith Summer Fellowship	2008
NSF Biogeochemistry and Environmental Biocomplexity Small Grant	2007

Honors and Awards

Outstanding Graduate Student, Iowa State University Department of Agronomy	2013
Crop and Soil Sciences Outstanding Teaching Assistant, Cornell University	2008
University of Minnesota - Morris Dean's Scholarship	2002-2006
Academic All-Conference Track and Field	2005, 2006
Academic All -Conference Cross Country	2005
All-American Wrestling	2003, 2004

Courses Taught

R for Data Science - 1 credit, every semester

This course covers the fundamentals of using R software to visualize, explore, and analyze data.

Data Stewardship for Earth Systems Scientists - 3 credit course, co-taught Fall 2016

This course taught students to clearly organize, track, and communicate data-based work, collect and house data through analysis and publication, collaborate in a reproducible way, model data structures and wrangle data, and complete the entire research cycle in a responsible way. <http://agron590-isu.github.io/>

Publications

Journal Articles

Cordova, S., Archontoulis, S., Dietzel, R., and M. Castellano. 2018. Plant litter quality affects the accumulation rate, composition, and stability of mineral-associated soil organic matter. *Soil Biology & Biochemistry* 125:115-124

Martinez-Feria, R., Castellano, M., Dietzel, R., Helmers, M., Liebman, M., and S. Archontoulis. 2018. Linking crop- and soil-based approaches to evaluate system nitrogen-use efficiency and tradeoffs. *Agriculture, Ecosystems & Environment* 256:131-143

Ordonez, R., Castellano, M., Hatfield, J., Helmers, J., Licht, M., Liebman, M., Dietzel, R., Martinez-Feria, R., Iqbal, J., Puntel, L., Cordova, C., Togliatti, K., Wright, E., and S. Archontoulis. 2018. Maize and soybean root front velocity and maximum depth in Iowa, USA. *Field Crops Research* 215:122-131

Togliatti, K., Dietzel, R., Puntel, L., Archontoulis, S., and A. VanLoocke. 2017. How does inclusion of weather forecasting impact in-season crop model predictions? *Field Crops Research* 214:261-272

Dietzel, R., Liebman, M., and S. Archontoulis. 2017. A deeper look at the relationship between root carbon pools and the vertical distribution of the soil carbon pool. *Soil*. [doi:10.5194/soil-2017-5](https://doi.org/10.5194/soil-2017-5)

- Puntel, L.A., Sawyer, J.E., Barker, D.W., Dietzel, R.N., Poffenbarger, H., Castellano, M., Moore, K.J., Thorburn, P., Archontoulis, S.V. 2016. Modeling long-term corn yield response to nitrogen rate and crop rotation. *Frontiers in Plant Science*. doi: 10.3389/fpls.2016.01630
- Nichols, V., Miguez, F., Sauer, T., Dietzel, R. 2016. Field-measured root-growth derived CO₂ respiration in continuous maize and reconstructed prairies. *Crop Science* 56 2791-2801
- Martinez-Feria, R.A., Dietzel, R., Liebman, M., Helmers, M.J., Archontoulis, S.V. 2016. Rye cover crop effects on maize: A system-level analysis. *Field Crops Research* 96: 145-159
- Dietzel, R., Liebman, M., Ewing, R., Helmers, M., Horton, R., Jarchow, M., and S. Archontoulis. 2016. How efficiently do corn- and soybean-based cropping systems use water? A systems modeling analysis. *Global Change Biology* 22: 666-681, DOI: 10.1111/gcb.13101
- Dietzel, R. Jarchow, M. and M. Liebman. 2015. Above- and belowground growth, biomass, and nitrogen use in maize and reconstructed prairie cropping systems. *Crop Science* 55:1-14
- Jarchow, M., Liebman, M., Dhungel, S., Dietzel, R., Sundberg, D., Anex, R., Thompson, M., and T. Chua. 2015. Tradeoffs among agronomic, energetic, and environmental performance characteristics of corn and prairie bioenergy cropping systems. *Global Change Biology Bioenergy* 7:57-71
- Dietzel, R and M. Liebman. 2014. Root inputs drive carbon storage potential differences in corn- and prairie-based cropping systems. Dissertation chapter. Order No. 3641012, Iowa State University, 2014, <http://search.proquest.com.proxy.lib.iastate.edu/docview/1622571419>
- Dietzel, R. and M. Liebman. 2014. Predicted changes in soil organic carbon over fifty years in corn- and prairie-based cropping systems. Dissertation Chapter. Order No. 3641012, Iowa State University, 2014, <http://search.proquest.com.proxy.lib.iastate.edu/docview/1622571419>
- Jarchow, M., Neal, J., Costanza, R., D'Adamo, S., Damery, P., and R. Dietzel, et al. 2012. The future of food and life: Four visions focused on Iowa. *International Journal of Agricultural Sustainability*. *International Journal of Agricultural Sustainability* 10:76-92
- Dietzel, R., Wolfe, D., and J. Thies. 2011. The influence of winter cover crops on spring nitrous oxide emissions from an agricultural soil. *Soil Biology & Biochemistry* 43:1989-1991

Extension Articles

- Castellano M, Archontoulis SV, Cordova C, Dietzel R, Poffenbarger H, 2016. Nitrogen myths and realities. In *Proceedings of the 28th ICM conference*, November 30-December 1, 2016, Ames, IA, pages 133-137
- Archontoulis SV, Licht M, Castellano M, Dietzel R, VanLoocke A, Ordonez R, Iqbal J, Puntel L, Cordova C, Togliatti K, Martinez-Feria R, Huber I, Helmers M, 2016. Understanding the 2016 yields and interactions between soils, crops, climate and management. In *Proceedings of the 28th ICM conference*, November 30-December 1, 2016, Ames, IA, pages 13-17
- Archontoulis SV, Dietzel R, Castellano M, VanLoocke A, Moore K, Puntel L, Cordova C, Togliatti K, Huber I, Licht M, 2015. Forecasting yields and in season crop water nitrogen needs using simulation models. In *Proceedings of the 27th ICM conference*, December 2-3, 2015, Ames, IA
- Archontoulis S, Licht M, Dietzel R, 2015. Wrap up and validation of the yield forecast project for 2015. *Integrated Crop Management News*. Paper 2134

Licht M, Archontoulis S, Dietzel R, 2015. In-season forecast of soil water-nitrogen and corn-soybean yields for central and northwest Iowa; August 12 Forecast. Integrated Crop Management News. Paper 822

Archontoulis S, Licht M, Dietzel R, 2015. In-season forecast of soil water-nitrogen and corn-soybean yields for central and northwest Iowa; an update. Integrated Crop Management News. Paper 675

Archontoulis S, Licht M, Dietzel R, 2015. In-season corn and soybean forecast of soil water-nitrogen and yields for central and northwest Iowa. A pilot project. Integrated Crop Management News. Paper 338

Castellano M, Archontoulis S, Cordova C, Dietzel R, Licht M, 2015. Fixing the soybean nitrogen credit. Iowa Soybean Association, Advance Newsletter

Licht M, Dietzel R, Archontoulis S, 2015. Using the soybean planting decision tool to help make planting date and maturity selection. Integrated Crop Management News

Licht M, Dietzel R, Archontoulis S, 2015. Soybean planting decision tool released to help farmers make informed decisions. Iowa Soybean Association, Advance Newsletter Archontoulis SV, 2014.

Cropping systems modelling tools to improve soybean management and yields in Iowa. Iowa Soybean Association, Advance Newsletter

Dietzel RN and Archontoulis SV, 2014. What is a cropping systems model? Iowa Soybean Association, Advance Newsletter

Presentations

Dietzel, R. Working towards a global estimate of N₂O emissions. 2017. Invited lecture: Iowa State University Department of Agronomy Seminar Series

Dietzel, R., Liebman, M., Ewing, R., Horton, R., and Archontoulis, S. 2016. How efficiently do corn- and soybean-based systems use water? A modeling analysis. Invited lecture: University of South Dakota Biology Seminar Series

Dietzel, R., Liebman, M., Ewing, R., Horton, R., and Archontoulis, S. 2015. How efficiently do corn- and soybean-based systems use water? A modeling analysis. ASA-CSA-SSA Annual Meeting, Minneapolis, MN

Dietzel, R., Archontoulis, S., and M. Liebman. 2014. Predicted changes in soil organic carbon over fifty years in corn- and prairie-based cropping systems. ASA-CSA-SSA Annual Meeting, Long Beach, CA

Dietzel, R. and M. Liebman. 2012. Root inputs drive C sequestration differences in corn and prairie cropping systems. ASA-CSA-SSA Annual Meeting, Cincinnati, OH

Dietzel, R. and M. Liebman. 2011. Root growth in corn- and prairie-based biofuel cropping systems. ISU Agronomy Research Symposium, Ames, IA

Dietzel, R. and M. Liebman. 2010. Root growth in corn- and prairie-based biofuel cropping systems. ISU Graduate Program in Sustainable Agriculture Symposium, Ames, IA

Dietzel, R. and M. Liebman. 2010. C sequestration in cornfields and prairies? Graduate Program in Sustainable Agriculture Colloquium, Ames, IA

Dietzel, R., Jarchow, M., Sundberg, D., and M. Liebman. 2009. A comparison of corn- and prairie-based cropping systems. ASA-CSA-SSSA Annual Meeting, Pittsburgh, PA

Dietzel, R., Jarchow, M., Sundberg, D., and M. Liebman. 2009. A comparison of biomass production in corn- and prairie - based cropping systems. Live Green! Sustainability Series Poster Presentation, Ames, IA

Dietzel, R., Jarchow, M., Sundberg, D., and M. Liebman. 2009. A comparison of biomass production in corn- and prairie - based cropping systems. BioCentury Research Farm Dedication, Ames, IA

Dietzel, R., Jarchow, M., Sundberg, D., and M. Liebman. 2009. A comparison of biomass production in corn- and prairie - based cropping systems. Biofuels Research at ConocoPhillips - Women in STEM Speaker Series, Ames, IA

Dietzel, R., Jarchow, M., Sundberg, D., and M. Liebman. 2009. A comparison of biomass production in corn- and prairie - based cropping systems. Iowa State Graduate Student in Sustainable Agriculture Annual Research Symposium, Ames, IA

Dietzel, R. 2008. The influence of winter field cover on spring nitrous oxide emissions. Cornell Crop and Soil Sciences Seminar Series, Ithaca, NY

Dietzel, R. and J. Thies. 2008. Surface insulation leads to higher N₂O fluxes during soil thawing. ASA-CSA-SSSA Annual Meeting, Houston, TX

Service and Membership

Reviewer - Plant Biology, Global Change Biology, Agronomy Journal, European Journal of Agronomy, Frontiers	
ISU Agronomy Postdoctoral Organization, Founder and Co-chair	2017-present
Rgronomists (R software use group) Founder and Organizer	2017-present
Iowa State University Science with Practice Undergraduate Mentor	2016
Agronomy, Crop Science, and Soil Science Societies of America, member	2006-2016
Graduate Program in Sustainable Agriculture	
Coordinating Committee	2010
Curriculum Committee	2011
Admissions Committee	2012
Agronomy Departmental Seminar Committee	2011, 2012
Environmental Working Group, Consultant	2011
Agronomy Graduate Student Club, President	2010
Candor, New York Town Planning Board	2008
Cornell Soil and Crop Science Graduate Student Association	
Secretary	2007
Co-chair	2008