

Rafael A. Martinez-Feria

NIFA Postdoctoral Research Fellow

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Education

Ph.D. Crop Production and Physiology 2018
Iowa State University, Ames, Iowa

M.S. Sustainable Agriculture, Crop Production and Physiology 2015
Graduate Certificate in Geographic Information Systems
Iowa State University, Ames, Iowa

Ing. Agrónomo (B.S. Agronomy Engineering) 2012
Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Querétaro, México

Professional Appointments

NIFA Postdoctoral Research Fellow 2019
Computational Agronomy and Spatial Analytics Laboratory
Department of Earth and Environmental Sciences, Michigan State University

Publications

Refereed Journal Articles

Martinez-Feria, R.A., M.A. Licht, R.A. Ordóñez, J.L. Hatfield, and S.V. Archontoulis. 2019. Evaluating maize and soybean grain dry-down in the field with predictive algorithms and genotype-by-environment analysis. *Scientific Reports*, 9:7167 10.1038/s41598-019-43653-1

Cordova, S.C, M.J. Castellano, R.D., M.A. Licht, K. Togliatti, **R.A Martinez-Feria**, S.V. Archontoulis. Soybean nitrogen fixation dynamics in Iowa, USA, *Field Crops Research* 236: 165-176 10.1016/j.fcr.2019.03.018

Martinez-Feria, R.A., M.J. Castellano, R.N. Dietzel., M.J. Helmers, M. Liebman, I.L. Huber and S.V. Archontoulis. 2018. Linking crop- and soil-based approaches to evaluate system nitrogen-use efficiency and tradeoffs. *Agriculture Ecosystems and Environment*, 256(15): 131-143. doi: 10.1016/j.agee.2018.01.002

Ordóñez, R.A., M.J. Castellano, J.L. Hatfield, M.J. Helmers, M.A. Licht, M. Liebman, R.N. Dietzel, **R.A. Martinez-Feria**, J. Iqbal, L.A. Puntel, S.C. Córdoba, K. Togliatti, E. Wright, and S.V. Archontoulis. 2018. Maize and soybean root front velocity and maximum depth in Iowa, USA. *Field Crops Research*, 215:122-131. doi: 10.1016/j.fcr.2017.09.003

Martinez-Feria, R.A., R.N. Dietzel, M. Liebman, M.J. Helmers, and S.V. Archontoulis. 2016. Rye cover crop effects on maize: a system-level analysis. *Field Crops Research*, 196:145-159. doi: 10.1016/j.fcr.2016.06.016

Martinez-Feria, R.A., T.C. Kaspar and M.H. Wiedenhoef. 2016. Seeding date affects fall growth of winter canola (*Brassica napus* L.'Baldur') and its performance as a winter cover crop in central Iowa. *Crop, Forage & Turfgrass Management*, 2(1) doi: 10.2134/cftm2015.0181

Manuscripts in Submission

Shuai, G., **R. Martinez-Feria**, J. Zhang, S. Li, R. Price, B. Basso. Capturing maize stand heterogeneity across yield-stability zones using Unmanned Aerial Vehicles (UAV), *Sensors* (Submitted July 4, 2019)

Archontoulis, S.V., M.J. Castellano, M.A. Licht, M.J. Helmers, A. Vanloocke, M. Liebman, J.L. Hatfield, D. Herzmann, I.L. Huber, R.N. Dietzel, R.A. Ordóñez, J. Iqbal, **R.A. Martinez-Feria**, L.A. Puntel, S.C. Cordova, E. Wright, P. Edmonds, K. Moore, K. Togliatti, M. Baum, A. Kessler, G. Danalatos, V. Nichols, E. Ebrahimi, M. Woods, C. Peterson, K. Lamkey. Forecasting and assessing cropping systems performance in the US Corn Belt, *Crop Science* (Submitted Nov. 15, 2018)

Book Chapters

Basso, B. **R.A. Martinez-Feria**, B. Dumont, Chapter 11: Modeling Crop Rotations: Capturing Short- and Long-term Feedbacks for Sustainability and Soil Health *in* Advances in crop modelling for a sustainable agriculture (ed. Emeritus Prof Ken Boote). *In press* Burleigh Dodds Science Publishing.

Extension and Other Publications

Martinez-Feria, R.A., S.V. Archontoulis and M. Licht. Insights into 2018 corn dry down. Integrated Crop Management (ICM) Blog. 21 September, 2018. Iowa State University Extension, Ames, Iowa.

Martinez-Feria, R.A., M. Licht and S.V. Archontoulis. Corn grain dry down in field from maturity to harvest. Integrated Crop Management (ICM) News. 20 September, 2017. Iowa State University Extension, Ames, Iowa.

Martinez-Feria, R.A., M. Licht and S.V. Archontoulis. How fast do soybeans dry down in the field. Integrated Crop Management (ICM) News. 19 September, 2017. Iowa State University Extension, Ames, Iowa.

Martinez-Feria, R.A. and S.V. Archontoulis. Understanding rye cover crop effects on corn with a system analysis. Integrated Crop Management (ICM) Encyclopedia Article. Iowa State University Extension, Ames, Iowa.

Martinez-Feria, R.A., K. Jacobs and M.H. Wiedenhoef. 2016. Estimated costs of production for winter canola in Iowa (A1-24). Ag Decision Maker. Iowa State University Extension, Ames, Iowa.

Martinez-Feria, R.A., M.H. Wiedenhoef and S.R. Gailans. 2015. Winter canola used as a cover crop in Iowa. Practical Farmers of Iowa Cooperators' Program, Ames, Iowa.

Awards and Honors

- 2018 Outstanding Ph.D. Student Award (\$500) Feb. 2019
Agronomy Graduate Student Club,, Iowa State University
- Distinguished Master's Thesis Award (\$1,000) Apr. 2018
Midwestern Association of Graduate Schools (MAGS)/ProQuest, Grand Rapids, Michigan
- Oral Presentation Student Competition, 3rd place (\$100) Nov. 2016
Session: Cover crop management, American Society of Agronomy International Meetings, Phoenix, Arizona
- Research Excellence Award (\$200) Aug. 2015
Iowa State University, Graduate College, Ames, Iowa
- Vernon C. Miller Scholarship in Agronomy (\$900) Sep. 2015
Iowa State University, Department of Agronomy, Ames, Iowa
- Best Poster Presentation Award (\$50) May 2013
8th Annual Graduate Minority Assistantship Program Research Symposium, Iowa State University, Ames, Iowa
- Honorable Mention Apr. 2013
9th Annual Graduate Program in Sustainable Agriculture Research Symposium Poster Competition, Iowa State University, Ames, Iowa

Fellowships and Grants

- National Institute of Food and Agriculture (NIFA) 2019-2021
Agriculture and Food Research Initiative-Education and Workforce Development (AFRI-EWD) Postdoctoral Fellowship grant. Title: Designing sustainable mixed grain-bioenergy cropping systems for current and future climates. \$165,000
- Sustainable Agriculture Research and Education (SARE) 2013-2015
Graduate Student Grant. Principal Investigator (Advisor: Mary H. Wiedenhoef). Title: Suitability of winter canola (*Brassica napus*) for enhancing summer annual crop rotations in Iowa. \$10,000
- Leopold Center for Sustainable Agriculture. 2012-2013
Research Grant. Co-Principal Investigator. Title: Suitability of winter canola (*Brassica napus*) for enhancing summer annual crop rotations in Iowa. \$32,000

Invited Speaker

- Computational agronomy as integrator of knowledge for facing 21st century challenge. Agronomy Department, Purdue University. West Lafayette, Ind. April 4, 2019
- A career trajectory in agriculture: From food and travel to science and sustainability. Midwestern Association of Graduate Schools 74th Annual Meeting, Grand Rapids, Mich. April 5, 2018

Conference Presentations

- Martinez-Feria, R.A.**, B. Basso. Evaluating pathways for sustainable integration of cellulosic bioenergy feedstock production to Midwestern farms. Great Lakes Bioenergy Research Center 2019 Annual Science Meeting, Lake Geneva., Wisc. May 22, 2019.
- Martinez-Feria, R.A.**, M.A. Licht, R.A. Ordóñez, J.L. Hatfield, and S.V. Archontoulis. An improved algorithm to predict in-field dry-down of maize and soybean grains with genotype-by-environment analysis. Session: Climatology and Modeling Oral II. American Society of Agronomy, Crop Science Society of America, Canadian Society of Agronomy International Meetings. Baltimore, Md. 6 Nov. 2018.
- Martinez-Feria, R.A.**, and S.V. Archontoulis. Environmental and management drivers of nitrate losses: Modeling tile-drained corn-soybean cropping systems across a pedo-climatic gradient (accepted abstract). Session: Climatology and Modeling Oral. American Society of Agronomy, Crop Science Society of America, Canadian Society of Agronomy International Meetings. Baltimore, Md. 6 Nov. 2018.
- Martinez-Feria, R.A.**, M.A. Licht, R.A. Ordóñez, J.L. Hatfield, and S.V. Archontoulis. Modeling maize and soybean post maturity grain drydown (poster presentation). Plant Sciences Symposium, Kansas State University, Manhattan, Kan. 6 Sep. 2018.
- Nichols, V., **Martinez-Feria, R.A.**, S.V. Archontoulis, and M.J. Helmers. How does residue affect tile drainage? (poster presentation). Production Agriculture Symposium, University of Minnesota Twin-Cities, St. Paul, Minn. 15 Feb. 2018.
- Archontoulis, S.V., I.L. Huber and **R.A. Martinez-Feria**. Soybean crop modeling highlights from the Forecast and Assessment of Cropping systems (FACTS) Project (poster presentation). Iowa Soybean Association Research Conference, Des Moines, Iowa. Feb. 6-7, 2018
- Huber, I.L., D. Laird, **R.A. Martinez-Feria**, and S.V. Archontoulis. Environmental impacts of large scale biochar application through spatial modeling (poster presentation). New Orleans, La. Dec. 11-15, 2017
- Martinez-Feria, R.A.**, M.J. Castellano, M.J. Helmers, M. Liebman, R.N. Dietzel, I.L. Huber and S.V. Archontoulis. High crop nitrogen-use efficiency does not translate into low environmental losses in the Midwestern US (oral presentation). Session 336: Nitrogen efficiency, cycling and environmental impacts. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America International Meetings. Tampa, Fla. 25 Oct. 2017.
- Martinez-Feria, R.A.**, I.L. Huber and S.V. Archontoulis. (poster presentation) Modeling NO₃-N leaching from two long-term experiments using APSIM. Iowa Water Conference - Watershed Management: Partnerships for Progress. Ames, Iowa. Mar. 22-23, 2017.
- Martinez-Feria, R.A.**, R.N. Dietzel, M. Liebman, M.J. Helmers and S.V. Archontoulis. Rye cover crop effects on maize: A system-level analysis (oral presentation). Session 42: Cover crop management oral. American Society of Agronomy, Crop Science Society of

America, Soil Science Society of America International Meetings. Phoenix, Ariz. 7 Nov. 2016.

Martinez-Feria, R.A., T.C. Kaspar and M.H. Wiedenhoef. An empirical approach to estimating seeding dates for winter canola in Iowa (poster presentation). Session 109: Canola research poster session. U.S. Canola Association Research Conference. Long Beach, Calif. 4 Nov. 2014.

Martinez-Feria, R.A., M.H. Wiedenhoef and T.C. Kaspar. Suitability of winter canola for enhancing summer annual crop rotations in Iowa (poster presentation). George Washington Carver Life and Legacy Symposium. Ames, Iowa. 23 Apr. 2014.

Martinez-Feria, R.A., M.H. Wiedenhoef and T.C. Kaspar. Suitability of winter canola for enhancing summer annual crop rotations in Iowa (poster presentation). Session 301: Water, nutrients, and conservation systems. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America International Meetings. Tampa, Fla. 5 Nov. 2013.

Martinez-Feria, R.A., M.H. Wiedenhoef and T.C. Kaspar. Suitability of winter canola for enhancing summer annual crop rotations in Iowa (poster presentation). 8th Annual Graduate Minority Assistantship Program Research Symposium. Ames, Iowa. 14 May 2013.

Departmental Seminars

Drivers of yield and nitrogen-loss tradeoffs: Cropping system evaluations with process-based modeling (Dissertation Seminar). 12 November 2018. Department of Agronomy, Iowa State University. Ames, Iowa.

Suitability of winter canola for enhancing summer annual crop rotations in Iowa (Thesis Seminar). 26 May 2015. Department of Agronomy, Iowa State University. Ames, Iowa.

Teaching Experience

Iowa State University

Teaching Practicum Fall 2018
Crop Development, Production and Management (undergraduate class). One-week intensive practicum involving curriculum development and lecturing for one course unit (Nutrient management in cropping systems).

Workshop instructor Jun. 2017, 2018
Evaluating Production and Environmental Performance of Cropping Systems with APSIM. Assisted trainees with practical questions about workshop exercises and assignments, and presented lectures about running APSIM with R.

Guest Lecturer

Field Exploration in Agronomy	2018
Agronomy MS Practicum	2018
International Farmers Aid Association Young Farmer Training	2016

Professional Development in Agronomy: Orientation 2013, 2016

Mentorship, Science with Practice 2014-2016

Mentored three undergraduate students during experiential learning and work program. Guided students through field and lab experimentation, data analysis and scientific writing.

Mentees:

Mitchell Baum; Undergraduate at ISU; M.S. student at ISU 2016

Alyssa Waldschmit; Undergraduate at ISU; Farmer 2016

Alexandria Harvey; Undergraduate at ISU; Project Manager at United Nations Organisation for the Prohibition of Chemical Weapons 2014

Extension and Outreach Experience

Field day presenter, Iowa State University Extension. 2016, 2017

Multiple sessions about diverse topics to audiences including farmers and FFA students. Iowa State University Research Farms

Expert presenter, World Food Prize Iowa Youth Institute. 2013-2017

Yearly classroom and field sessions on environmental issues in agriculture to motivate high-achieving high school students to pursue careers in agriculture and life sciences

Invited Scientist, Lincoln-Rails Academy, Des Moines, Iowa 2017

Guest lecture about environmental issues in agriculture to the 7th grade science class

Outreach coordinator, Center for Rural Affairs, Lyons, Nebraska. 2011

Led the program for socially disadvantaged farmers and ranchers

Research experience

Graduate Research Assistant, Department of Agronomy, Iowa State University

Integrated Cropping Systems Lab 2015-2018

Conducted system-level studies on nitrogen cycling and other topics, advised by Dr. Archontoulis.

Alternative Cropping Systems Lab 2012 - 2015

Led field plot and laboratory experiments on corn, soybean, and winter canola crop rotations advised by Dr. Wiedenhoeft and Dr. Kaspar.

Independent Study, Escuela de Agronomía, Alimentos y Biotecnología, ITESM

Dairy herd health management 2012

Validated a molecular test to detect *Mycobacterium avium* subsp. paratuberculosis in dairy herds in central Mexico under the direction of Dr. Vázquez Flores.

Undergraduate Research Assistant, Department of Agronomy, Iowa State University

Soil Fertility Lab 2010

Contributed field data collection to a study on winter rye cover crops effects on soil nitrogen cycling, supervised by Dr. José Pantoja and Dr. John Sawyer

Service to the field

Journal reviewer

<i>European Journal of Agronomy</i>	2018-present
<i>Agriculture Ecosystems and the Environment</i>	2018-present
<i>Agronomy (MDPI)</i>	2017-present
<i>Agronomy Journal</i>	2016-present

University and Departmental Service

Search committee 2017
Tenure-track position in Integrated Cropping Systems. Department of Agronomy, Iowa State University.

Organizing committee 2014
9th Graduate Minority Assistantship Program Research Symposium. Iowa State University.

Extracurricular Activities

Founding member of Agronomists Graduate Student Club 2017-2018

Treasurer of the Agronomy Graduate Student Club 2013

Various positions in the International Association of Students in Agricultural and Related Sciences (IAAS):

Control Committee IAAS World	2012-2013
Vice President of Mexico Chapter	2011-2012
Social Action Coordinator of Mexico Chapter	2009-2010
World Congress Organizing Committee	2009

Technical Competencies

Cropping Systems Modeling: APSIM

Geographical Information Systems: ArcGIS, QGIS, ErdasImagine

Programming languages: R, SQL, javascript, html

Technical Trainings

Evaluating Production and Environmental Performance of Cropping Systems with APSIM. Jun. 2016 (3-day workshop). Iowa State University Extension, Ames, Iowa

Hyperspectral Techniques and Applications. Apr. 2016 (two-day workshop). Iowa Experimental Program to Stimulate Competitive Research (EPSCoR), Ames, Iowa

Precision Ag Data Management Workshop. Mar. 2015 (one-day course). University of Nebraska-Lincoln Extension, Auburn, Nebraska

Technical Skills for Greenhouse Management. Apr. 2012 (one-week course). Koppert-Rapel Research and Training Center (CEICKOR), Querétaro, México

Languages

English
Spanish (native)

Professional Affiliations

American Society of Agronomy	2013-present
Crop Society of America	2013-present
Soil Science Society of America	2013-present
Practical Farmers of Iowa	2013-2015

Professional References

Bruno Basso

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Dept. of Earth and Environmental Sciences, Michigan State University
Address: 288 Farm Lane #307, East Lansing, MI 488011
Phone: (517) 353-9009
Email: basso@msu.edu

Sotirios Archontoulis

Assistant Professor
Dept. of Agronomy, Iowa State University
Address: 1216 Agronomy Hall, Ames, IA 50011
Phone: (515) 450-4580
Email: sarchont@iastate.edu

Mindy De Vries-Gelder (Teaching Reference)

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Dept. of Agronomy, Iowa State University
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