Mitchell G. Roth

Curriculum vitae

University of Wisconsin–Madison
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RESEARCH AND SCHOLARSHIP

EDUCATION

2019 – present **Postdoctoral Research Associate**
University of Wisconsin – Madison — Co-advisor: Dr. Mehdi Kabbage
Department of Plant Pathology — Co-advisor: Dr. Damon Smith

2014 – 2019 **Ph.D. – Genetics and Plant Pathology**
Michigan State University — Advisor: Dr. Martin Chilvers
Dissertation Title: Investigating Management and Genetics of Soybean Sudden Death Syndrome Pathogens *Fusarium virguliforme* and *F. brasiliense*

2010 – 2014 **B.S. – Cell and Molecular Biology**
Grand Valley State University — Advisor: Dr. Margaret Dietrich
Minor: Applied Statistics

EMPLOYMENT

2019 – present **Postdoctoral Research Associate – UW–Madison**
Propose, design, and perform experiments
Mentor, guide, and support graduate students
Metabolic and genetic engineering of soybean to improve resistance to *Sclerotinia sclerotiorum*

2014 – 2019 **Graduate Research Assistant – Michigan State University**
Proposed, designed, and performed experiments
Addressed fundamental questions regarding the management of soybean sudden death syndrome

2013 **Student Summer Scholar – Grand Valley State University**
Examined the role of CBL10 in stamen development in *Arabidopsis*

2012 **Student Orientation Leader – Grand Valley State University**
Assisted freshmen in registering for classes and navigating campus

2008 – 2011 **Farmhand – Roth Brothers Farms Inc.**
Operated large farm equipment during planting and harvest

AWARDED GRANTS, FELLOWSHIPS, AND SCHOLARSHIPS

2019	Paul Taylor Travel Award (APS, Cleveland, OH)	
2018	Paul Taylor Travel Award (APS, Boston, MA)	
2018	Terry N. & JoAnn L. Turk Endowed Fellowship Award	$2,000
2017	Paul Taylor Travel Award (APS, San Antonio, TX)	
2017	MSU Graduate School Writing Fellow	$2,000
2017	Everett S. "Tex" Beneke Mycology Graduate Student Fellowship	$1,000
2016	Paul Taylor Travel Award (MPMI, Portland, OR)	
2015	Syngenta Agricultural Scholarship, National winner	$5,000
2015	Syngenta Agricultural Scholarship, Regional winner	$1,000
2015	Paul Taylor Travel Award (APS, Pasadena, CA)	
2015	Buckley Creek Ag Services Scholarship	$1,000
2015	Kellogg Biological Station Long Term Ecological Research Small Grant	$2,000
2015	Michigan State University Plant Science Fellowship	$8,000
2015	Everett S. "Tex" Beneke Mycology Graduate Student Fellowship	$900
2014	BioMolecular Sciences Gateway Program Fellowship	$39,000
2014	Outstanding CMB Student Award	
2013	Howard and Rose Stein Biology Scholarship	$1,000
2013	Waddell Treanor Native Plants Endowment – John Shontz Scholarship	$3,000
2013	Grand Valley Award for Excellence	
2013	Outstanding CMB Student Award	
2013	Focus on the Finish Grant	$1,000
2013	Student Summer Scholars Grant	$3,000
2012	Outstanding CMB Student Award	

PEER REVIEWED PUBLICATIONS

* indicates co-first author

20XX Webster, R.W., **Roth, M.G.**, Mueller, B., Gaska, J., Mueller, D.S., Chilvers, M.I., Conley, S., and Smith, D.L. Evaluation of Soybean Management Practices for Integrated Sclerotinia Stem Rot Control. *In prep.*

20XX ***Roth, M.G.**, *Webster, R.W., Mueller, D.S., Chilvers, M.I., Faske, T.R., Mathew, F.M., Bradley, C.A., Damicone, J.P., Kabbage, M., and Smith, D.L. Integrated Management of Important Soybean Pathogens of the United States in Changing Climate. J. Integr. Pest Manage. *Submitted.*

2020 **Roth, M.G.**, Jacobs, J.L., Napieralski, S., Byrne, A.M., Stouffer-Hopkins, A., Warner. F., Chilvers, M.I. Fluopyram Suppresses Population Densities of *Heterodera glycines* in Field and Greenhouse Studies in Michigan. Plant Disease. DOI 10.1094/PDIS-04-19-0874-RE.

2020 **Roth, M.G.**, Sang, H., Oudman, K., Jacobs, J.L., Griffin, A., and Chilvers, M.I. Diagnostic qPCR Assay to Detect *Fusarium brasiliense*, a causal agent of soybean Sudden Death Syndrome and Root Rot of Dry Bean. Plant Disease. DOI 10.1094/PDIS-01-19-0016-RE.

2019 *McCoy, A.G., ***Roth, M.G.**, *Shay, R., *Noel, Z.A., Jayawardana, M.A., Longley, R.W., Bonito, G., and Chilvers, M.I. Next Generation Sequencing

Identification of Fungal Communities Within the Tar Spot Complex of Corn in Michigan. Phytobiomes. DOI 10.1094/PBIOMES-03-19-0017-R.

2019 **Roth, M.G.**, and Chilvers, M.I. A Protoplast Generation and Transformation Methods for Soybean Sudden Death Syndrome Causal Agents *Fusarium virguliforme* and *F. brasiliense*. Fungal Biology and Biotechnology. DOI 10.1186/s40694-019-0070-0.

2019 **Roth, M.G.**, Noel, Z.A., Wang, J., Byrne, A.M., Chilvers, M.I. Predicting Soybean Yield and Sudden Death Syndrome Development using At-planting Risk Factors. Phytopathology. DOI 10.1094/PHYTO-02-19-0040-R.

2019 Noel, Z.A., Sang, H., **Roth, M.G.**, and Chilvers, M.I. Convergent evolution of C239S mutation in *Pythium* spp. β-tubulin coincides with inherent insensitivity to ethaboxam. Phytopathology. DOI 10.1094/PHYTO-01-19-0022-R.

2019 Strock, C.F., Schneider, H.M., Galindo-Castañeda, T., Hall, B.T., Van Gansbeke, B., Mather, D.E., **Roth, M.G.**, Chilvers, M.I., Guo, X., Brown, K., and Lynch, J.P. Laser Ablation Tomography for Visualization of Root Colonization by Edaphic Organisms. Journal of Experimental Botany. DOI 10.1093/jxb/erz271.

2018 Sang, H., Witte, A., Jacobs, J.L., Chang, H.-X., Wang, J., **Roth, M.G.**, and Chilvers, M.I. Fluopyram sensitivity and functional characterization of SdhB in the *Fusarium solani* species complex causing soybean sudden death syndrome. Frontiers in Microbiology. DOI 10.3389/fmicb.2018.02335.

2018 Wang, J., Jacobs, J.L., **Roth, M.G.**, Chilvers, M.I. Temporal dynamics of *Fusarium virguliforme* colonization of soybean roots. Plant Disease. DOI 10.1094/PDIS-03-18-0384-RE.

2018 Chang, H.-X., **Roth, M.G.**, Wang, D., Lightfoot, D.A., Hartman, G.L., Cianzio, S.R., Chilvers, M.I. Integration of Sudden Death Syndrome Resistance Loci in the Soybean Genome. Theoretical and Applied Genetics. DOI 10.1007/s00122-018-3063-0.

2016 Kuhlgert, S., Austic, G., Zegarac, R., Osei-Bonsu, I., Hoh, D., Chilvers, M.I., **Roth, M.G.**, Bi, K., TerAvest, D., Weebadde, P., Kramer, D.M. MultispeQ Beta: a tool for large-scale plant phenotyping connected to the open PhotosynQ network. Royal Society Open Science. DOI 10.1098/rsos.160592.

FORMAL PRESENTATIONS AND POSTERS

Represents first / presenting author only.
Total of 19 presentations.

2019 **Roth, M.G.** Epidemiology and Emerging Technology: New Tools for Understanding Plant Pathogens. Colorado State University, Fort Collins, CO, USA. ***Invited Presentation***

2019 **Roth, M.G.** Integrating Prediction Models, Molecular Genetics, and "-omics" to Manage Diseases of Field Crops. Colorado State University, Fort Collins, CO, USA. ***Invited Presentation***

2019 **Roth, M.G.**, and Chilvers, M.I. Studying the *in vitro* interactions between *Fusarium virguliforme* and soil-borne nematodes using fluorescent microscopy. American Phytopathological Society Annual Meeting. Cleveland, OH, USA. ***Oral Presentation***

2019 **Roth, M.G.** Investigating management and genetics of soybean sudden death syndrome pathogens *Fusarium virguliforme* and *F. brasiliense*. PhD Defense Seminar, Michigan State University. ***Oral Presentation***

2019 **Roth, M.G.** Investigating Management and Genetics of Soybean SDS Pathogens. Friday at 4 Seminar, University of Wisconsin – Madison. ***Invited Presentation***

2018 **Roth, M.G.**, Jacobs, J.L., Napieralski, S., Byrne, A., Warner, F., and Chilvers, M.I. Investigating fluopyram as a seed treatment against soybean cyst nematode in the presence of *Fusarium virguliforme*. International Congress for Plant Pathology (ICPP). Boston, MA, USA. ***Poster Presentation***

2018 **Roth, M.G.**, Chilvers, M.I. Preventing Soybean Yield Losses Caused by *F. virguliforme* and soybean cyst nematode. Genetics and CMB Research Forum. East Lansing, MI, USA. ***Oral Presentation***

2017 **Roth, M.G.**, Chilvers, M.I. Risk Factors Associated with Sudden Death Syndrome in Soybeans. MSU Plant Pathology Seminar. East Lansing, MI, USA. ***Oral Presentation***

2017 **Roth, M.G.**, Chilvers, M.I. Root Infection of Soybean (*Glycine max*) and Dry Bean (*Phaseolus vulgaris*) by *Fusarium virguliforme*. International Legume Root Diseases Workshop. East Lansing, MI, USA. ***Invited Presentation***

2017 **Roth, M.G.**, Chilvers, M.I. Risk factors associated with the development of soybean sudden death syndrome. MSU BioMolecular Sciences Retreat. East Lansing, MI, USA. ***Invited Presentation***

2017 **Roth, M.G.**, Noel, Z.A., Wang, J., Byrne, A.M., Chilvers, M.I. Assessment and utilization of risk factors in predicting the development of soybean sudden death syndrome. American Phytopathological Society Annual Meeting. San Antonio, TX, USA. ***Oral Presentation***

2017 **Roth, M.G.**, Noel, Z.A., Chilvers, M.I. Assessment of risk factors for making predictions of soybean sudden death syndrome (SDS) symptom development. Michigan Agri-Business Association Meeting. Lansing, MI, USA. ***Oral Presentation***

2016 **Roth, M.G.**, Wang, J., Noel, Z.A., Papenfuss, E., Austic, G., TerAvest, D., Yang, Y., Chen, J. Kramer, D.M., Chilvers, M.I. Photosynthesis measurements using PhotosynQ reflects soybean root health and helps predict sudden death syndrome (SDS) symptom development. IS-MPMI Congress. Portland, OR, USA. ***Poster Presentation***

2016 **Roth, M.G.** Wang, J., Noel, Z.A., Papenfuss, E., Austic, G., TerAvest, D., Yang, Y., Chen, J. Kramer, D.M., Chilvers, M.I. Photosynthesis measurements using PhotosynQ reflects soybean root health and helps predict sudden death

syndrome (SDS) symptom development. MSU PhotosynQ Workshop. Michigan State University, East Lansing, MI, USA. ***Poster Presentation***

2015 **Roth, M.G.**, Rojas, J. A., Wang, J., Chilvers, M.I. A rapid and reliable isothermal diagnostic assay for detecting soybean sudden death syndrome (SDS) pathogen *Fusarium virguliforme*. American Phytopathological Society Annual Meeting. Pasadena, CA, USA. ***Poster Presentation***

2015 **Roth, M.G.**, Rojas, J. A., Wang, J., Chilvers, M.I. A multiplexed diagnostic assay for detecting *Fusarium virguliforme* and other closely related soybean pathogens. North Central American Phytopathological Society Meeting. East Lansing, MI, USA. ***Oral Presentation***

2015 **Roth, M.G.**, Rojas, J. A., Wang, J., and Chilvers, M.I. Rapid and reliable isothermal detection of soybean sudden death syndrome (SDS) pathogen *Fusarium virguliforme*. Graduate Academic Conference. East Lansing, MI, USA. ***Oral Presentation***

2013 **Roth, M.G.**, and Dietrich, M. The role of CBL10 in stamen development in *Arabidopsis thaliana*. West Michigan Regional Undergraduate Science Research Conference. Grand Rapids, MI, USA. ***Poster Presentation***

2013 **Roth, M.G.**, and Dietrich, M. The role of CBL10 in stamen development in *Arabidopsis thaliana*. Student Summer Scholars Showcase. Allendale, MI, USA. ***Poster Presentation***

PROFESSIONAL DEVELOPMENT AND SOCIETIES

2019 **Leadership Institute Workshop (through APS)**

2016-present **Molecular Plant-Microbe Interactions (MPMI)**
1 poster presentation at annual meetings

2014-present **American Phytopathological Society (APS)**
Biotechnology Committee Chairperson
2 oral presentations at annual meetings
3 poster presentation at annual meetings
1 Idea Café session organized
1 Special Session organized (APS 2020)

2014 – 2018 **American Association for the Advancement of Science**

2018 **Certification in College Teaching Institute, MSU**

2015 **Graduate Student Leadership Summit, MSU**

2015 **Introduction to Python, MSU ICER workshop**

2015 **Responsible Conduct of Research Certificate, MSU**

EXTENSION AND OUTREACH

EXTENSION

2019 Michigan Soybean Promotion Committee Research Update

2018 Corn Working Group Meeting Presentation on Tar Spot

2018 Michigan Soybean Promotion Committee Promotional Video

2018 Michigan Soybean Promotion Committee Research Update

2017 Michigan Soybean Promotion Committee Research Update

2016 Michigan Soybean Promotion Committee Research Update
2015 Michigan Soybean Promotion Committee Research Update

OUTREACH

As Presenter, Leader, or Instructor

2018 MSU Science Festival
2017 Grandparents University (MSU)
2017 MSU Science Festival
2017 Lansing, MI Charter Academy Science Experience
2016 Grandparents University (MSU)
2016 Darwin Discovery Day (MSU)
2015 Soybean Pathogen Diagnostics Workshop (MSU)
2015 Ridge Park Charter Academy (Grand Rapids, MI)
2013 Grandparents, Grandkids, and Grand Valley Camp (GVSU)

As Volunteer

2019 Donley Elementary STEAM Night
2018 Red Cedar School Science Night
2018 Pinecrest School Science Night
2017 East Lansing Elementary School Science Night

TEACHING AND LEADERSHIP ROLES

TEACHING

2019 **Certificate in College Teaching** (*pending approval*)
Generated teaching philosophy
Attended 2-day teaching institute workshop
Developed and implemented a mentored teaching project

2019 **Graduate Teaching Assistant – Michigan State University**
ZOL 341 – Fundamental Genetics
Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking

2018 **Graduate Teaching Assistant – Michigan State University**
ZOL 341 – Fundamental Genetics
Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking
Two guest lectures, >150 students each
Student Feedback: "The TA took over for a couple lectures and taught notably better [than the professor]." – anonymous student

2016 **Graduate Teaching Assistant – Michigan State University**
ZOL 341 – Fundamental Genetics
Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking

Student Feedback: "Mitch the TA rocked. He was super easy to talk to and tried to make the material as easy to understand as possible." – anonymous student

LEADERSHIP AND COMMITTEE ROLES

2017-present **American Phytopathological Society (APS)**
- APS Council Leadership Fellow (2019)
- Biotechnology Committee Chair (2018-2019)
- Biotechnology Committee Vice-Chair (2017-2018)

2015-2019 **MSU Genetics Graduate Student Organization (GSO)**
- Outreach Co-Chairperson (2018–2019)
- President (2017–2018)
- Outreach Chairperson (2015-2017, 2018)
- Founder of Outreach Program (2015)
- 2nd Year Student Representative (2015)

STATEMENT OF DIVERSITY

An opportunity is one of the most important things anyone can give or receive. I love the academic setting on college campuses because everyone there is looking for an opportunity to make themselves a better person, make their world a better place, or both. The motivation to find these opportunities is common among students from all ethnicities and cultures. When this motivation is fostered, it can lead to unique collaborations and new solutions to complex problems. I have been given many opportunities in my career, and been mentored by both men and women, older and younger, from numerous cultures and ethnicities. Every opportunity I have been given has been because of someone's effort to include me, and I am proud of the things I have accomplished. However, I recognize that my accomplishments are a culmination of motivation, help, and support from others, in addition to my physical efforts.

Because of these experiences, I am committed to emphasizing inclusion in any position of leadership that I find myself in. I want to include others so that they can have similar experiences like I have and identify their personal skills and weaknesses, learn about new subjects, and find personal satisfaction in their work. I have been able to help others seize opportunities, watch them grow, and make significant advances in their learning and understanding along the way.

During graduate school, I was often approached for help troubleshooting and setting up qPCR experiments. Since PCR and qPCR were some of the first techniques I learned during my undergraduate research experience, I was comfortable talking to others about troubles they might be having with the technique. By taking time to help others with these techniques, I provided an opportunity for them to share their research motivations and articulate what they needed, while also providing guidance towards a solution to the hurdles they faced. Many of these cases moved projects forward and allowed other projects to be finished and written up for publication. I believe that these types of mentoring opportunities should be fostered at universities because they help drive projects forward for all people involved, and most people are at the university to better themselves and the world they live in. I will continue to seek funding to provide more opportunities like these for undergraduate students and under-represented graduate students. By providing opportunities to students, they can gain new perspectives and skills, and by working with them, I will gain new perspectives and skills too.