

R. Michael Miller

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EDUCATION

PhD.	Illinois State University	Mycology
M.S.	Illinois State University	Biological Sciences
B.S.	Colorado State University	Botany & Plant Pathology

PROFESSIONAL APPOINTMENTS

2007-present	Senior Fellow, Institute for Genomics and Systems Biology
1986-present	Terrestrial Ecology Group Leader
2005-2008	Biosciences Division Deputy Division Director
1997-present	Senior Terrestrial Ecologist, Argonne National Laboratory
1988-present	Lecturer, Committee on Evolutionary Biology, University of Chicago
1983-1998	Terrestrial Ecologist, Argonne National Laboratory
1977-1983	Assistant Ecologist, Argonne National Laboratory
1975-1977	Post doctoral Associate, Argonne National Laboratory

Honors

Member, College of Arts and Sciences Hall of Fame, Illinois State University, 2009
Outstanding Mentor Award, U.S. Department of Energy, Office of Science, Undergraduate Research Programs, 2008
Pacesetter Award, Argonne National Laboratory, 1986
Phi Sigma Award of the Beta Lambda Chapter for outstanding dissertation research

Selected publication (http://scholar.google.com/citations?hl=en&user=miaEiK4AAAAJ&view_op=list_works)

- Miller, R. M., G.W.T. Wilson, N.C. Johnson. 2012. Arbuscular Mycorrhizae and Grassland Ecosystems, in *Biocomplexity of Plant-Fungal Interactions* (D. Southworth, ed), Wiley-Blackwell, Oxford, UK. pp 59-84.
- Podila G.K., R.M. Miller, L.L. Cseke, H.L. White, V.J. Allison. 2011. Chapter 13. Ecogenomics of mycorrhizal interactions mediated by Aspen Genome under elevated ozone and carbon dioxide. In: *Genetics, Genomics and Breeding of Poplar*, C.P. Joshi, S. DiFazio and C. Cole, eds. Science Publ., Enfield, New Hampshire, USA, pp. 327-352
- Gray, S.B., A.T. Classen, P. Kardol, Z. Yermakov, R.M. Miller. 2011. Multiple climate change factors interact to alter soil microbial community structure in an old-field ecosystem. *Soil Science Society of America Journal* 75: 2217-2226
- Fitzsimons, M.S., R.M. Miller. 2011. The importance of soil microorganisms for maintaining diverse plant communities in tallgrass prairie. *American Journal of Botany* 97: 1937-1943
- Miller, R.M., M.S. Fitzsimons. 2011. Fungal growth in soils. In: *Architecture and Biology of Soil*. K. Ritz and I.M. Young, eds. CABI publishers, pp. 149-163.
- Johnson, N.C., G.W.T. Wilson, M.A. Bowker, J. Wilson, R.M. Miller. 2010. Resource limitation is a driver of local adaptation in mycorrhizal symbioses. *PNAS* 107: 2093-2098
- van Diepen, L.T.A., E.A. Lilleskov, K.S. Pregitzer, R.M. Miller. 2010. Chronic nitrogen addition causes a decline of intra- and extraradical abundance of arbuscular mycorrhizal fungi and changes microbial community composition in northern hardwood forests. *Ecosystems* 13: 683-695.
- Garten C.T., J.L. Smith, D.D. Tyler, J.E. Amonette, V.L. Bailey, D.J. Brice, H.F. Castro, R.L. Graham, C.A. Gunderson, R.C. Izaurrealde, P.M. Jardine, J.D. Jastrow, M.K. Kerley, R. Matamala, M.A. Mayes, F.B. Metting, R.M. Miller, K.K. Moran, W.M. Post, R.D. Sands, C.W. Schadt, J.R. Phillips, A.M. Thomson, T. Vugteveen, T.O. West, and S.D. Wulfschleger. 2010. Intra-annual changes in biomass, carbon, and nitrogen dynamics at 4-year old switchgrass field trials in west Tennessee, USA. *Agr Ecosys Environ* 136:177-184.
- Fitzsimons, M.F, R.M. Miller, J.D. Jastrow. 2008. Niche space of arbuscular mycorrhizal fungi and scale dependent plant/microbe interactions. *Oecologia* 158(1):117-27.
- Matamala, R., J.D. Jastrow, R.M. Miller, C.T. Garten. 2008. Temporal Variations in the Distribution of C and N Stocks in the Vegetation and Soils of Restored Tallgrass Prairie Grasslands in the U.S. Midwest. *Ecological Applications* 18: 1470-1488.
- van Diepen, L.T.A., E.A. Lilleskov, K.S. Pregitzer and R.M. Miller. 2007. Decline of arbuscular mycorrhizal fungi in northern hardwood forests exposed to chronic nitrogen deposition. *New Phytologist* 176: 175-183
- Jastrow, J.D., R.M. Miller, R. Matamala, R.J. Norby, T.W. Boutton, C.W. Rice, and C.E. Owensby. 2005. Elevated atmospheric CO₂ increases soil carbon. *Global Change Biology* 11:2057-2064.

- Allison, V.J., R.M. Miller, J.D. Jastrow, R. Matamala, D.R. Zak. 2005. Characterization of environmental and edaphic factors affecting soil microbial community structure in a tallgrass prairie chronosequence. *Soil Science Society America Journal* 69:1412-1421.
- Zhu Y.G., R.M. Miller. 2003. Carbon cycling by arbuscular mycorrhizal fungi in soil-plant systems. *Trends in Plant Science* 8: 407-409.
- Miller R.M., S. Miller, J.D. Jastrow, C.B. Rivetta. 2002. Mycorrhizal mediated feedbacks influence net carbon gain and nutrient uptake in *Andropogon gerardii* Vitman. *New Phytologist* 155: 149-162.
- Schultz, P., R.M. Miller, C. Rivetta, J.D. Jastrow, J. Bever. 2001. Evidence of a mycorrhizal mechanism for the adaptation of *Andropogon gerardii* to high and low-nutrient prairies. *American Journal of Botany* 88: 1650-1656.
- Miller R.M., J.D. Jastrow. 2000. Mycorrhizal fungi influence soil structure. In: *Arbuscular Mycorrhizas: physiology and function*, Y. Kapulnik and D. Douds, eds. Kluwer Academic Publishers, Dordrecht, p 4-18.
- Miller, R.M. and M. Kling. 2000. The importance of integration and scale in the arbuscular mycorrhizal symbiosis. *Plant and Soil* 226: 295-309.

COLLABORATORS & OTHER ASSOCIATIONS

Collaborators (past 5 years): Victoria Allison (Landcare Research, NZ), James Amonette (PNNL), Vanessa Bailey (PNNL), Thomas Boutton (Texas A&M), Keith Clay (Indiana U), Charles Garten (ORNL), Catherine Gehring (Northern Arizona U.), Miquel Gonzalez-Meler (U. Illinois Chicago), Robin Graham (ORNL), Jason Hoeksema (U. California Santa Cruz), Cesar Izaurralde (PNNL), Nancy Johnson (Northern Arizona U.), John Klironomos (U. Guelph), Roger Koide (Penn State U.), John Moore (Northern Colorado U.), Richard Norby (ORNL), Wilfred Post (ORNL), Gail Wilson (Oklahoma State U.), Donald Zak (U. Michigan), Yunguan Zhu (Chinese Academy Science, Beijing). **Graduate advisor:** Anthony E. Liberta (ISU retired). **Postdoctoral advisor:** Roy Cameron (USEPA, Las Vegas, retired). **Postdoctoral advisees:** Victoria Allison (Landcare Research, NZ); Jim Bever (Indiana U); Helen Rowe (Purdue U)

SYNERGISTIC ACTIVITIES

Service: Steering committee, Fungal Genome Sequencing for Energy Security and Bioenergy, DOE National Laboratories, 2006-present; Technical advisory committee member for Ecosystem Management Projects (SEMP), Strategic Environmental Research and Development Program (SERDP) USDOD, 2003-2006; Steering committee member, Nutrient Farming along the Illinois River, The Wetland Initiative, 2004-2009; Chairperson, Student Awards Committee, Soil Ecology Society Biennial Meeting, 1995, 1997, 1999, 2003, 2005, 2007; Chairperson, Distinguished Scientist Award Committee, Soil Ecology Society, 2005; Advisor to the John D. & Catherine T. MacArthur Foundation in the area of Restoration Ecology, 1997; Member of Steering Committee, Mycorrhizal Inoculum Project, BAIF - India, Sponsored by the International Development Research Centre (IDRC), Ottawa, Canada, 1993-1996; Plenary Speakers Committee, 1st International Conference on Mycorrhizae, Univ. of California, Berkeley, Aug. 1996; Public Affairs Representative to the AIBS for the Mycological Society of America, (two 3 yr terms, 1986-1992); Editorial Board, Restoration and Management Notes, U Wisconsin Press, 1985-1989; Member advisory committee, Univ Wisconsin Arboretum, Restoration and Research Directions at the Arboretum, 1984

Review and Advisory: Panel member, USDOE/BER TES Program 2012; Member, USEPA 2005 STAR Panel, Nonlinear Responses to Global Change in Linked Aquatic and Terrestrial Ecosystems and Effects of Multiple Factors on Terrestrial Ecosystems, 2006; Panel member, DOE/BER Poplar Genome Based Research, 2005; Panel member, DOE/BER Global Climate Research Graduate Fellowship Program, 2002; Panel member, Management Review of NIGEC Midwest Regional Center, 2002; Panel member, Biosphere II, Future research directions, 2001; Member, Carbon Sequestration Panel, OBER/USDOE, 2000; Panel Member, DOE Global Climate Research Graduate Fellowship Program, 1999; Panel Member, USDA-NRI Soils and Soil Biology Panel, Competitive Grants Program, 1998; Panel Member, NSF Special Competition for Global Climate Research, 1996; Panel Member, NSF Special Competition for Global Climate Research, 1995; Panel Member, USEPA, Evaluation of Ecological and Non-Target Effects of Transgenic Plants, 1992; Panel Member, NSF Special Competition in Conservation and Restoration Biology, 1991;

RESEARCH INTERESTS

Mechanisms of adaptation in plants and mycorrhizal fungi, especially as influenced by environmental forcing factors and disturbance; Effects of mycorrhizal fungi on community structure and function; Ecophysiology of the mycorrhizal symbiosis; Application of molecular tools to understanding root-rhizosphere mechanisms. Influences of roots and microbes on the formation and stabilization of soil structure; the contributions of roots and soil microbes to carbon accrual mechanisms in soils; Restoration ecology; Sustainable management of soil systems. Identification of root and mycorrhizal traits in biofuel crops for improved nutrient uptake and soil carbon sequestration.