



David H. McNear Jr.

Assistant Professor of Rhizosphere Science

Curriculum Vitae

University of Kentucky
2007-2012

TABLE OF CONTENTS

A. EDUCATION.....	2
B. EMPLOYMENT HISTORY.....	2
C. RESEARCH (75% DOE).....	2
1. Grant Funding	2
a. Extramural	2
i. Federal (Nationally/Internationally Competitive).....	2
ii. National Lab User Time (internationally competitive)...	3
iii. State/University (Internally Competitive)	4
iv. Private Contracts	4
b. Proposals Submitted	4
D. PUBLICATIONS.....	5
1. Refereed Journal Articles	5
2. Refereed Proceedings Articles	5
3. Refereed Book Chapters.....	5
4. Publications prior to UK	5
5. Publications Submitted or Under Review	6
6. Other Publications	7
7. Published Abstracts.....	8
E. TEACHING AND ADVISING (DOE 25%)	9
1. Courses taught and TCE scores	9
2. Guest Lectures and Seminars	9
3. Graduate Student Advising	9
4. Post-doctoral Scholars Advised	10
5. Undergraduate Student Advising	10
6. Activities to improve teaching and learning	10
F. SERVICE AND RECOGNITION	10
1. Outreach.....	10
2. Awards and honors.....	11
3. Reviewer Services	12
4. Committees.....	12
G. PROFESSIONAL DEVELOPMENT.....	12
1. Professional meetings attended.....	12
2. Professional Meetings/Sessions Organized	12
3. Society Affiliation.....	13

Rhizosphere Science Laboratory

“Where the root



Meets the soil”

David H. McNear Jr.

N122S Ag. North Bldg
University of Kentucky
Lexington, KY 40546-0091

dave.mcnear@ukyu.edu

Phone: (859) 257-8627

Fax (859) 257-3655

Lab Website: www.rhizolab.com

A. EDUCATION

- Ph.D., Environmental Soil Chemistry, University of Delaware, Feb 2006
- M.S., Environmental Pollution Control, Pennsylvania State University, May 2001
- B.S. Environmental Resource Management, Pennsylvania State University, Dec 1997
- A.A. Life Science, Harrisburg Area Community College, May 1995

B. EMPLOYMENT HISTORY:

- Jan 2007-present Assistant Professor, Rhizosphere Science, University of Kentucky,
- 2006 (9mo.) Postdoctoral Associate, University of Delaware, Plant Biology
- 2001-2005 Graduate Research Fellow University of Delaware
- 1998-2001 Graduate Teaching/Research Assistant, The Pennsylvania State University

C. RESEARCH (DOE 75%)

Funding Summary

Nationally/internationally competitive.....	\$3,192,464
National Lab user time.....	\$198,980
State/Internally competitive	\$103,355
Industrial contracts.....	\$106,709
TOTAL FUNDING TO DATE.....	\$3,704,799
TOTAL AWARDED TO MY PROGRAM	\$1,286,203

1. GRANT FUNDING:

a. EXTRAMURAL

i. Federal (Nationally/Internationally Competitive)

1. Moe, L. (PI), **D.H. McNear** and S. Debolt (Co-PIs). 2011-2015. *Plant-Microbe communication in the Medicago truncatula rhizosphere: functional metagenomics, biochemistry and community analysis. USDA NIFA AFRI, Microbial Communities Program.....\$452,000 (10%)*
2. **McNear, D.H.**(PI), 2011-2013. *Influence of tall fescue cultivar and endophyte genotype combinations on root system architecture, exudate composition and soil biogeochemical properties. USDA NIFA-AFRI Microbial Communities Program.....\$265,000 (100%)*
3. **McNear, D. H.** (PI), N. Fierer (University of Colorado) and R. McCulley (University of Kentucky). 2008-2013. *Understanding endophyte effects on soil processes in tall fescue pastures: from rhizosphere to regional scales. USDA-NRI, Soil Processes Program.\$397,500 (90%)*

4. Bertsch, P.M. (Univ. of KY), S. MGrath (Rothamsted Research, UK), A. Neal (Rothamsted Research, UK), J. Unrine (Univ. of KY), **D. McNear** (Co-PI) Univ. of KY), O. Tsyusko (Univ. of KY), N. Kabengi (Univ. of KY), C. Svendsen (NERC Center for Ecology & Hydrology (CEH), Wallingford, UK), D. Spurgeon (CEH, Wallingford, UK), S. Lofts (CEH, Wallingford, UK), et. al. 2010-2014. *Transatlantic initiative for nanotechnology and the environment* (TINE). **Joint U.S. EPA- United Kingdom ENI**,**\$2,000,000** (10%)

ii. National Lab User Time (internationally competitive)

1. **McNear, D.H.** (PI) and A.E. del Real. 2011-2012. *Elucidating the Chromium Detoxification Pathway in the Metal Hyperaccumulator Silene vulgaris*. Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS) Awarded 6 days (19 shifts) of general user access to beamline 10.3.2. **PI, Internationally competitive...\$32,040*** (100%)
2. **McNear, D.H.** (PI) 2010-2012. *The role of metals in plant chemical defense response to insect herbivore attack*. Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS). Awarded 10 days (30 shifts) of general user access to beamline 10.3.2 **PI, Internationally competitive****\$50,580*** (100%)
3. **McNear, D.H.** (PI) 2008-2010. *Soil physiochemical properties influencing As, Cr and Cu mobility, bioavailability and potential trophic transfer across the landscape*. Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS). Awarded 7 days (21 shifts) of general user access to beamline 10.3.2. **PI, Internationally competitive..\$35,414*** (100%)
4. **McNear, D.H.** (PI) 2008-2010. *Soil physiochemical properties influencing As, Cr and Cu mobility, bioavailability and potential trophic transfer across the landscape*. Argonne National Laboratory, Advanced Photon Source (ANL-APS). Awarded 4 days (12 shifts) of general user access to beamline 13-ID. **PI, Internationally competitive...\$20,235*** (100%)
5. **McNear, D.H.** (PI) 2007-2009. *The distribution of Zn in raz (requires additional zinc) a Medicago truncatula (Barrel medic) mutant*. Brookhaven National Lab, National Synchrotron Light Source (BNL-NSLS). Awarded 8 days (24 shifts) of general user access to beamline X26A. **PI, internationally competitive** **\$40,474*** (100%)
6. **McNear, D.H.**, S. Afton (Univ. of Cincinnati) and J. Caruso (Univ. of Cincinnati). 2007-2008. *In search of a mercury-selenium antagonism in plants*. Proposal submitted to Argonne National Laboratory, Advanced Photon Source (ANL-APS). Awarded 4 days (12 shifts) of general user access to the Geology, Soils and Environmental Consortium for Advanced Radiation Sources (GSECARS) beamline 13-ID. **PI, internationally competitive**.....**\$20,237*** (100%)

* **PRT equiv.**– Participating Research Team – there is the option to buy time on these beamlines by becoming a PRT member. The purchase can be > \$30K per year depending on the beamline. The other option is to do what I have done which is to compete against other researchers via a proposal driven process for time on these instruments. I have, therefore, reported the dollar amt that would be required to purchase the amount of time I was awarded with the proposals I wrote based on the \$1686.42/8hr shift estimate provided by Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS) User Services Group leader Sue Bailey.

iii. State/University

1. D’Angelo, E., **D.H. McNear**, C. Agouridis, J. Hower, J. Unrine, and R. Warner. 2012. *Remediation of coal slurry impoundment liquids using a multi-stage constructed treatment wetland system*. Kentucky Department for Energy Development and Independence. State Competitive**\$ 61,355 (10%)**
2. **McNear, D.H.**, (PI) P.M. Bertsch and S. Debolt. (Co-PIs) 2010-2011. Integrated Research, Education and Extension to Enable Sustainable Bioenergy Production – A Proposed Workshop to Organize Research Efforts in the Southeast. U.S. KY-EPSCoR/CDRG State Competitive.....**\$30,000 (100%)**
3. Grabau L.(PI), **D.H. McNear** and M. Mullen (Co-PIs). 2006. *Technology support for a mastery learning initiative in a growing soil science course*. TASC Teaching + Technology Innovation Grant. Internally competitive. **\$12,500 (10%)**
4. **McNear D.H.**(PI). 2011. *“Video Devices and Student Videographers to Enhance Soils Instruction”*. TIFF Grant. Internally competitive. **\$4,000 (100%)**

iv. Private Contracts

1. **McNear, D.H.** (PI) 2009-present. Industrial contract with Advanced Microbial Solutions (AMS) in support of Rhizolab research projects on the influence of biological soil amendments on soil quality, microbial populations and plant growth parameters.**\$210,709 (100%)**

b. PROPOSALS SUBMITTED (pending or unfunded)

1. Bertsch, P.M., **D.H. McNear**, J.Judy and J. Unrine. 2013. Engineered nanomaterial (ENM) interactions with terrestrial fungi: Understanding the roles of particle and receptor surface chemistry and ENM toxicity. NSF-Division of Chemical, Bioengineering, Environmental and Transport Systems. **Acting-PI, nationally competitive****\$320,000 (pending)**
2. D’Angelo, E., **D.H. McNear**, C. Agouridis, J. Hower, J. Unrine, and R. Warner. 2012. *Remediation of coal slurry impoundment liquids using a multi-stage constructed treatment wetland system*. NSF-Division of Environmental Engineering. **Co-PI, nationally competitive****\$330,000 (pending)**
3. Matocha, C. and **D.H. McNear**. 2011. Mechanistic Studies of Nitrate and Nitrite Reduction at the Iron(II) Mineral-Water Interface. NSF-Division of Environmental Chemical Sciences. **Co-PI, nationally competitive**.....**\$224,164 (Unfunded)**
4. Bertsch, P.M., **D.H. McNear**, S. Grunwald, T. Teferi, D. Radcliffe, M. Risse, J. Molnar, C.E. Brummer *et al.* (~65 others). 2010. USDA AFRI NIFA Sustainable Bioenergy. Sustainable bioenergy coordinated agricultural project: toward sustainable bioenergy production systems in the Southeast U.S. **Co-PI, nationally competitive**.....**\$45,000,000 (Unfunded)**
5. Moe, L., **D.H. McNear** and S. Debolt. 2010. NSF Dimensions of Biodiversity. The effects of legume genetic diversity on the taxonomic and functional diversity of the associated rhizosphere microbial community. **Co-PI, nationally competitive**...**\$1,604,711 (Unfunded)**

D. PUBLICATIONS (*indicates my student, post-doc or lab analyst)

Refereed journal articles	15	Refereed book chapters	1
Journal articles in preparation/submitted.....	7	Published abstracts	25

1. REFEREED JOURNAL ARTICLES:

1. **McNear Jr., D.H.** *In Press*. The Rhizosphere – roots, soil and everything in between. *Nature Education*
2. Lewis, R.L.* , G. Tang and **D.H. McNear Jr.**. 2012. Morphological and Genetic Changes Induced by Excess Zn in Roots of *Medicago truncatula* A17 and a Zn Accumulating Mutant. *BMC Research Notes*. 5:675 (IF = 1.25)
3. Zhao, J., **D.H. McNear Jr.** and X. Xiong. 2012. Changes in Structural Characteristics of Antioxidative Soy Protein Hydrolysates Resulting from Scavenging of Hydroxyl Radicals. *Journal of Food Science*. (IF=1.73)
4. Schwer III, D.R.* and **D.H. McNear Jr.** 2011. Chromated copper arsenate treated fence posts in the agronomic landscape: soil properties controlling arsenic speciation and spatial distribution. *J. Environ. Qual.* 40(4):1172-1181. (IF=2.33)
5. **D.H. McNear Jr.**, S. Afton, and J. Caruso. 2011. Exploring the structural basis for selenium/mercury antagonism in *allium fistulosum*. *Metallomics*. 4, 267-276 (IF=3.902)
6. Shoults-Wilson, A., O.I. Zurbich, **D.H. McNear Jr.**, O.V. Tsyusko, P.M. Bertsch and J. Unrine. 2011. Evidence for avoidance of Ag nanoparticles by earthworms (*Eisenia fetida*). *Ecotoxicology*. 20:385-396 (IF= 3.05)
7. **McNear Jr., D.H.**, R.L. Chaney and D.L. Sparks. 2010. Hyperaccumulator *Alyssum murale* uses complexation with oxygen and nitrogen donor ligands for Ni transport and storage. *Phytochemistry*, 71:188-200. (IF = 2.32)

2. REFEREED PROCEEDINGS ARTICLES:

8. **McNear, Jr., D.H.** and R.L. McCulley. 2011. Influence of the *Neotyphodium* – tall fescue symbiosis on belowground processes. Proceedings of the 7th International Symposium on Fungal Endophytes of Grasses, Noble Foundation, Ardmore, OK.

3. REFEREED BOOK CHAPTERS

9. *Lewis, R.L., V. Mendu, **D.H. McNear** and G. Tang. 2010. Role of micro-RNA's in plant abiotic stress. *in* Molecular techniques for crop improvement, 2nd ed. Eds. S. Mohan Jain and D.S. Brar. Springer, Cambridge, MA.

4. PUBLICATIONS PRIOR TO UK

10. **McNear, D.H.**, R.L. Chaney and D.L. Sparks. 2007. The effects of soil type and chemical treatment on nickel speciation in refinery enriched soils: a multi-technique investigation. *Geochimica et Cosmochimica Acta*, 71(9) 2190-2208.
11. **McNear, D.H.**, R. Tappero and D.L. Sparks. 2006. Synchrotron based tomographic methods for determining metal compartmentalization and concentration in plant tissues. p. 204-205. *In*. Luster, J. and Finlay, R. Ed. COST 631 Handbook of methods in rhizosphere research. Swiss Federal Research Institute WSL, Birmensdorf.

12. Tappero, R., **D.H. McNear** and D.L. Sparks. 2006. Synchrotron micro x-ray fluorescence mapping and absorption edge spectroscopies for determining metal speciation in plant tissues. p. 209-210. *In*. Luster, J. and Finlay, R. Ed. COST 631 Handbook of methods in rhizosphere research. Swiss Federal Research Institute WSL, Birmensdorf.
13. Everhart, J.L., **D.H. McNear**, E. Peltier, D. VanderLelie, R.L. Chaney and D.L. Sparks. 2006. Assessing nickel bioavailability in smelter-contaminated soils. *Science of the Total Environment*, 367:732-744.
14. **McNear, D.H.**, E. Peltier, J. Everhart, R.L. Chaney, S. Sutton, M. Newville, M. Rivers, and D.L. Sparks. 2005. Application of quantitative fluorescence and absorption-edge computed microtomography to image metal compartmentalization in *Alyssum murale*. *Environ. Sci. Technol.* 2005, 39:2210-2218.
15. **McNear, D.H.**, R. Tappero and D.L. Sparks. 2005. Shining light on metals in the environment. *Elements*, 1, 211-216.

5. PUBLICATIONS SUBMITTED, UNDER REVIEW OR IN PREPARATION:

1. **McNear Jr., D.H.** and J.V. Kupper*. *In review*. Mechanisms of Manganese Tolerance in the Ni hyperaccumulator *Alyssum murale*. *New Phytologist* (**IF=5.23**)
2. *Ali, M.B. and **D.H. McNear Jr.** *In review*. Induced transcriptional profiling of phenylpropanoid pathway genes increased flavonoid content in Arabidopsis leaves in response to microbially-based soil amendments. *Journal of Experimental Botany* (**IF=5.364**)
3. *Sims, R., M. Reyzer, R. Capriolli, and **D.H. McNear Jr.** *In preparation*. Spatiotemporal tradeoffs of Zn for glucosinolates influence insect feeding in the Zn hyperaccumulator *Noccaea caerulescens*. *New Phytologist* (**IF=5.23**)
4. *Baltzley, S., **D.H. McNear Jr.** *In preparation*. The influence of microbial inoculants on rhizosphere microbial community structure, enzyme activity and Ni bioavailability in two *Alyssum* species. *Soil Biology and Biochemistry* (**IF=4.04**)
5. *Guo, J., R. McCulley, **D.H. McNear Jr.** *In preparation*. Influence of cultivar and fungal endophyte genotype on root exudate composition: Implications for C and N cycling in grassland ecosystems. *Plant and Soil* (**IF=2.73**)
6. *Pradas del Real, A.E., **D.H. McNear Jr.**, A. Perez-Sanz. *In preparation*. Elucidating the chromium detoxification pathway in the multi-metal accumulator *Silene vulgaris*. *Environ. Sci. Technol.* (**IF=5.28**)

6. OTHER PUBLICATIONS

1. **McNear, D.H.** and D.R. Schwer. 2010. Pressure treated lumber in the landscape: occurrence and safety precautions. UK Environmental and Natural Resource Issues Newsletter, Spring 2010

7. PUBLISHED ABSTRACTS ([†]Indicates presenting author. * Indicates graduate student of mine. Volunteered unless otherwise indicated)

1. [†]McNear Jr., D.H. 2012. **Invited**. From Rhizosphere to Ecosystems: Heavy Metals and Plant Defense. The 21st Annual Goldschmidt Conference, Montreal, CA. June 20-26th

2. †McNear Jr., D.H. 2012. Mass spectrometric imaging of glucosinolates in metal hyperaccumulating plant *Noccaea caerulescens*. SSSA international meetings, Cincinnati, OH, Oct 21-24.
3. †* Lewis. R. 2012. Manufactured Nanomaterials and Plant Growth Promoting Rhizobacteria: Building a Microbial Perspective of the Nano Age. SSSA international meetings, Cincinnati, OH, Oct 21-24.
4. †* Guo, J., R. McCulley and D.H. McNear Jr. 2012. From Rhizobox to field scale: influence of Tall fescue cultivar and endophyte status on rhizosphere processes. SSSA international meetings, Cincinnati, OH, Oct 21-24.
5. †* Ali, M.B. and D.H. McNear Jr. 2012. Plant Biosensors: Monitoring changes in the PPP in response to microbial based soil additives. America Society of Plant Biologists annual meetings. Austin, TX, July 20-24.
6. †* Sims, R. and D.H. McNear Jr. 2011. Metal uptake and Its utility for insect herbivore defense in *Noccaea Caerulescens*. SSSA international meetings, Austin, TX, Oct 16-19.
7. †* Guo, J., and D.H. McNear Jr. 2011. Influence of Tall fescue cultivar and endophyte genotype on rhizosphere processes. SSSA international meetings, Austin, TX, Oct 16-19.
8. †McNear, D.H. 2011. **Invited**. The use of synchrotron methods to elucidate metal behavior in the terrestrial environment. 21st Annual International Congress on X-ray Optics and Microanalysis (ICXOM21), Campinas, Brazil.
9. †McCulley, R.L., McNear, Jr., D.H., and J. Iqbal. June 2010. Effects of fungal endophyte symbiosis on belowground processes. International Symposium on Fungal Endophytes of Grasses, Lexington, KY.
10. †*Schwer, D. R. and D.H. McNear. 2010. Concentration and Chromium and Copper in the Soil System Adjacent to Chromated Copper Arsenate Treated Lumber Fence Posts. SSSA International Annual Meetings Long Beach, CA, Oct 31-Nov3
11. Afton, S., D.H. McNear, S. Mounicou, S. Yathavakilla and J.A. Caruso[†]. Exploring the structural basis of antagonism between mercury and selenium in green onion. 2009. Int. Conf. on Analytical Sciences and Spectroscopy, Kingston, ON, Canada.
12. †McNear, D.H. 2009. **Invited**. Fence posts: A surprising biogeochemical story. Special Seminar. UC Davis, Davis, CA.
13. †McNear, D.H. 2009. Response of soil processes to an above ground plant-fungal symbiosis: From rhizosphere to regional scales. AFRI-PD meeting. Michigan State University, East Lansing, MI.
14. †*Schwer, D. R. and D.H. McNear. 2009. Concentration and Speciation of Arsenic, Chromium, and Copper in Soil System Adjacent to Chromated Copper Arsenate Treated Lumber Fence Posts. SSSA International Annual Meetings, Pittsburgh, PA.
15. †Afton, S.E., D.H. McNear and J. Caruso. 2009. Exploring the structural basis of the antagonism between mercury and selenium in *Allium fistulosum* (green onion). International Symposium on Metallomics, Cincinnati, USA, June 7-10.

16. Afton, S., D.H. McNear, S. Mounicou, S. Yathavakilla and J.A. Caruso[†]. 2009. Metallomics approaches to study phytoremediation and Se/Hg antagonism in plants, *Colloquium Spectroscopium Internationale*, Budapest, Hungary.
17. Afton, S., D.H. McNear, S. Mounicou, S. Yathavakilla and J.A. Caruso[†]. 2009. Metallomics approaches to study phytoremediation and Se/Hg antagonism in plants, BAM, *Bundesanstalt für Materialforschung und -prüfung*, Berlin, Berlin DE
18. Afton, S., D.H. McNear, S. Mounicou, S. Yathavakilla and J.A. Caruso[†]. 2009. Metallomics, an approach for studying phytoremediation and Se/Hg antagonism in plants, *Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)*, Louisville, KY
19. Afton, S., D.H. McNear, S. Mounicou, S. Yathavakilla and J.A. Caruso[†]. 2008. Elemental Speciation for Improved Approaches to Study Se Phytoremediating Plants and Selenium/Mercury Antagonism in Plants, *EnviroAnalysis*, Toronto CA, June.
20. ^{†*}Lewis, R.L., M. Grusak, D.J. Sherrier and D.H. McNear. 2008. The influence of soil metal concentrations on root nodule formation and function. *7th Annual Posters-at-the-Capitol*, Frankfort, KY.
21. [†]McNear, D.H. 2008. Speciation and spatial distribution of Cr, Cu and As from CCA treated fences across the KY landscape. *72nd Annual Meeting of the Agronomy Society, Crop Science Society and Soil Science Society of America*, Houston, TX.
22. [†]McNear, D.H. 2008. Metal physiology and nodule development in a *Medicago truncatula* mutant that requires additional zinc (raz). *72nd International Annual Meeting of the Soil Science Society of America*, Houston, TX.
23. [†]McNear, D.H., and J. Kupper. 2007. The influence of endophyte infection on rhizosphere biogeochemical processes: tall fescue as a model. *71st International Annual Meeting of the Soil Science Society of America*, New Orleans, Louisiana.
24. [†]Grabau, L.H., D.H. McNear and M. Mullen. 2007. Technology support for a mastery learning initiative in an expanding soil science course. *71st International Annual Meeting of the Soil Science Society of America*, New Orleans, Louisiana.
25. ^{†*}Lewis, R.L., D.H. McNear, M. Grusak and D.J. Sherrier. 2007. The influence of soil metal concentrations on root nodule formation and function. *71st International Annual Meeting of the Soil Science Society of America*, New Orleans, Louisiana.

E. TEACHING AND ADVISING (DOE 25%)

1. COURSES TAUGHT AND TCE SCORES

PLS 366 – Fundamentals of Soil Science

GEN 300 – Undergraduate Experience in College Teaching

Semester	Course	Student #	Lab Sections	Avg. course Evaluation Score*	Avg. Teacher Evaluation Score*
Fall 2007	PLS 366 (4 cr.)	52	4	3.5/4.0	3.8/4.0
Fall 2008	PLS 366 (4 cr.)	40	3	3.6/4.0	3.8/4.0
Fall 2008	GEN 300 (3cr.)	3	N/A	See portfolio	NEW COURSE See portfolio
Fall 2009	PLS 366 (4 cr.)	44	3	3.4/4.0	3.7/4.0
Fall 2009	GEN 300 (3cr.)	2	N/A	See portfolio	See portfolio
Fall 2010	PLS 366 (4cr)	55	4	3.6/4.0	3.9/4.0
Fall 2011	PLS366 (4cr)	57	4	3.4/4.0	3.7/4.0
Fall 2012	PLS366 (4cr)	54	4	pending	pending

* For comparison - Avg. course rating UK = 3.3/4.0, CAg = 3.4/4.0; Avg. teacher rating UK = 3.4/4.0, CAg = 3.4/4.0

2. GUEST LECTURES AND SEMINARS

- McNear, D.H. 2010. The Plant Rhizosphere. Presented to ABT101 Sept 22nd, 2010.
- McNear, D.H. 2010. Plant-based methods for the removal of metals from contaminated soils. Presented to PLS 597 (IPS625) Sept, 8th 2010.
- McNear, D.H. 2009. Rhizosphere Science: Plant soil interactions and everything in between. Plant Physiology Seminar. University of Kentucky, Lexington, KY.
- McNear, D.H. 2009. Rhizosphere Science: Plant soil interactions and everything in between. Plant Pathology Seminar. University of Kentucky, Lexington, KY.
- McNear, D.H. 2007. Multitrophic influences of the plant mycorrhizal association. Presented to IPLSS 625: Integrated Transdisciplinary Research. Instructors. Drs. Mark Coyne, Robert L. Houtz and Dave VanSanford. University of Kentucky

3. GRADUATE STUDENT ADVISING:

a. Primary Graduate Advisor

- Rick Lewis, MS in Integrated Plant and Soil Sciences. 2009-2011. Thesis "*Zn responses in medicago truncatula: a study of miRNA expression, root growth, metal uptake and nodulation in M. truncatula WT and RAZ (requires additional Zn).*"
- Don Schwer, MS in Plant and Soil Sciences. 2008-2010. Thesis "*Chromium, Copper and Arsenic concentrations and speciation in soils adjacent to CCA treated lumber along a topohydrosequence.*"
– Received Peaslee Award for outstanding graduate student in Department of Plant and Soil Sciences
- Jingji Guo, PhD Candidate in Plant Physiology, 2009-present. Thesis "*The influence of tall fescue cultivar and endophyte genotype on root exudate chemistry and rhizosphere processes.*"

- Rebecca Sims, M.S. Candidate in Integrated Plant and Soil Sciences. Aug. 2010-Dec. 2012
Thesis *“Examining the metal defense hypothesis for the evolutionary adaptation of plants to metal rich soils.”*
- Sarah Baltzley, M.S. Student in Integrated Plant and Soil Sciences. Aug. 2010-Aug.2012.
Thesis *“Effectiveness of Plant Growth Promoting Rhizobacteria (PGPR) at enhancing metal uptake in the Ni hyperaccumulator Alyssum murale”*
- Rick Lewis, PhD. Candidate in Integrated Plant and Soil Sciences, 2010-present. Co-adviser with Dr. Paul Bertsch. Thesis *“Implications of manufactured nanomaterials in the terrestrial environment. - agroecosystem”*
- Kativa Mizin, M.S. Candidate in Plant and Soil Sciences, 2012-present. Co-adviser with Christa Jacobsen. Thesis *“Nitrogen cycling in high tunnel production systems”*

b. Committee Member

- Shawn Lucas - PhD in Plant and Soil Sciences, Univ. of KY. *Degree in Progress.*
- Jon Judy - PhD in Plant and Soil Sciences, Univ. of KY. *Degree in Progress.*
- Sewwandi Rathnayake - PhD in Plant and Soil Sciences, Univ. of KY. *Degree in Progress.*
- Laura Mitchel, M.S. in Plant and Soil Sciences, *Degree in Progress*
- Robert Caudle, PhD in Crop Sciences, Univ. of KY. *Degree in Progress*
- Marton Szoboszlai, PhD in Plant and Soil Sciences, Univ. of KY, *Degree in Progress*
- Anne Koontz, PhD in Animal Science, Univ. of KY, *Degree in Progress*
- Derek Law, PhD. In Geography, Univ. of KY, *Degree in Progress*
- Sagarika Banarjee – M.S. in Plant and Soil Sciences, Univ. of KY. Completed Sp 10.
- Bhavana Singh Agrawal - PhD in Plant and Soil Science, Univ. of Del. *Completed Sp11.*

c. Visiting Student Advisor

- Ana Pradas del Real, visiting PhD. Candidate from Department of Agroenvironmental research in IMIDRA (Madrid, Spain) Oct 2011-March 2012

4. POST-DOCTORAL SCHOLARS ADVISED:

- **Dr. Usha Balasundaram** (2009), **Na Ding** (2012-present), **Allison Monsanto** (starting March 2013), **Dr. Mohamad Babar Ali** (2010-present)

5. UNDERGRADUATE STUDENT ADVISING/MENTORING:

- Rick Lewis - Completed an undergraduate Thesis in my lab in pursuit of his B.S. in Interdisciplinary Environmental Studies from U.K.
- Ryan Quire - NRES major working in my lab now pursuing an MS degree at Montana State University
- Sally Chambers – NRES undergrad working in my lab now pursuing a PhD at Purdue University
- Rebecca Sims – NRES undergrad worked in my lab and is now pursuing a MS in IPSS in my lab
- Ryan Hammond – ABT undergrad

- Janet Chappell – worked in my lab for summer 2010 as an ABT undergrad developing a 96 well plate soil enzyme assay for the rhizosphere processes and corn domestication project
- Julie Lambers – ABT undergraduate working on rhizosphere processes and corn domestication project.
- Mentored 8 undergraduate TA's in the GEN300 I started entitled Undergraduate Experience in College Teaching (UGECT) which accompanies PLS366
- Academic advisor for 9 students in the Natural Resource and Environmental Sciences (NRES formerly NRCM) program

6. ACTIVITIES TO IMPROVE TEACHING AND LEARNING

- Participation in training seminar from Turning Point Technologies on the incorporation of audience response software/equipment into the teaching classroom. June 6, 2009.
- Peer review by Dr. Mark Williams, March 2009
- Participated in TASC directed seminar on how to write good multiple choice questions as part of the Teaching + Technology Innovation Grant
- Participation in training seminar from Turning Point Technologies on the incorporation of audience response software/equipment into the teaching classroom. June 6, 2008.

F. SERVICE AND RECOGNITION

1. OUTREACH:

- Mentor for two (2) Dunbar High School junior-seniors (Orsolya Hegyi and Debbie Furgeson) who worked/work in my lab on a research project as part of the Kentucky Young Researchers Program (KYRP)
- Working with Lexington Montessori High School students to develop protocols for evaluating soils and composts used for year-long unit on food production
- Coordinated efforts with Paul Kamps (SSSA Development officer), Wilbur Frye (Retired UKY faculty), Steve Blanford (NRCS) and others in the state of KY to raise awareness and funds to support the inclusion of the Crider Soil Series (KY State Soil) in the National Soils Exhibit at the Smithsonian Institute in Washington, D.C.
- Tour guide for Ag day event at Spindletop Farm
- Worked with Carol Hanley and the teachers of Lebanon Middle School as part of an NSF ITEST workshop to help develop instructional plans related to soils for 6-8th graders

2. AWARDS AND HONORS:

- **Presidential Early Career Award for Scientists and Engineers (PECASE).** 2009.
 - *The PECASE Award is the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers.*
- Recipient of the UK Ag Student Council **Early Career Teaching Award.** 2009.
- Selected as a National Academy of Sciences **Kavli Frontiers Fellow,** 2010

2. REVIEWER SERVICES:

- Annals of Botany, Soil Science Society of America Journal, Plant and Soil, Environmental Chemistry, Australian journal of Environmental Chemistry, Geochemica Cosmochimica Acta, Environmental Science and Technology,

3. COMMITTEES:

a. College

Natural Resources/Environmental Sciences Planning Initiative (2007), Undergraduate Programs Steering Committee, Precision Resource Management Proposal Committee, NRCM Curriculum Development Committee, Ag North Lab Space Allocation and Use Committee, College Committee on GEN100/200, Ad-Hoc Committee on Teaching Evaluation

b. Department

Departmental Display Committee, Departmental Web Page Committee, Chair/Co-Chair Departmental Seminar Committee 2007-2008, HPLSS

G. PROFESSIONAL DEVELOPMENT

1. PROFESSIONAL MEETINGS ATTENDED:

- 21st Annual International Congress on X-ray Optics and Microanalysis (ICXOM21), Campinas, Brazil. Sept 3-7, 2011.
- SSSA-CSA-ASA-GSA Joint Meetings, San Antonio, TX Oct 15-19, 2011
- AFRI-Project Directors meetings, 2009 (East Lansing, MI), 2010 (Washington, D.C.), 2011 (Asheville, N.C.)
- National Academy of Sciences 12th Japanese-American Kavali Frontiers of Science symposium December 2-6, 2010 . Chiba, Japan.
- *The symposium is co-sponsored by the Japan Society for the Promotion of Science and the U.S. National Academy of Sciences and is the Academy's premiere activity for distinguished young scientists.*
- SSSA-CSA-ASA-GSA Joint Meetings, Houston, TX Oct 5-8, 2008
- SSSA-CSA-ASA Annual Meetings, New Orleans, LA Nov 4-9, 2007
- From Dialog to Action – Changing teaching and learning: First Steps form the Summit. June 11-13, 2007. College Station, TX.

2. PROFESSIONAL MEETINGS/SESSIONS ORGANIZED:

- From Sorption to Bioavailability, S2/S11 Cosponsored. 2011. 73rd International Annual Meeting of the Soil Science Society of America, San Antonio, TX.
- Frontiers of Rhizosphere Science. NSF sponsored symposium. March 2011.
- Japanese-American Frontiers of Science Symposium (JAFoS), Earth and Environmental Sciences division organizing Co-Chair 2011-2014
- Integrated research, education and extension to enable sustainable bioenergy production: A workshop to organize research efforts in the Southeast U.S. Lexington, KY, May 11th – 14th, 2010.

- Integrated research, education and extension to enable sustainable bioenergy production: Core site selection and performance metrics. Lexington, KY, June 14th -15th, 2010.
- It's About Interfaces: Plant-Soil-Microbe Interactions that Influence Contaminant Cycling in the Critical Zone. 2009. 73nd International Annual Meeting of the Soil Science Society of America, Pittsburgh, PA.

3. SOCIETY AFFILIATIONS

- Soil Science Society of America (SSSA), Crop Science Society of America (CSSA), American Society of Agronomy (ASA), North American Colleges and Teachers of Agriculture (NACTA)