Mark A. Williams

Curriculum Vitae

I. Education

- Doctor of Philosophy, Developmental and Cell Biology, University of California, Irvine, 1998. Dissertation Title: RNA Editing Site Recognition in Plant Mitochondria.

- Bachelor of Science, School of Biological Sciences, University of Kentucky, 1989. Major: Botany.

II. Professional Employment

- Associate Professor - Department of Horticulture, University of Kentucky. January 1, 2007-present.

- Assistant Professor - Department of Horticulture, University of Kentucky. January 1, 2001-December 31, 2006.

- Post-Doctoral Scholar - Department of Horticulture, University of Kentucky. August 1999-December 2000.

- Post-Doctoral Scholar - Department of Developmental and Cell Biology, University of California, Irvine. August 1998-July 1999.

- Lecturer - Department of Developmental and Cell Biology, University of California, Irvine. August 1998-June 1999.

III. Honors and Awards

- Teachers Who Made a Difference Award, University of Kentucky College of Education. April, 2012

- NACTA (North American Colleges & Teachers of Agriculture) Teacher Fellow Award. June, 2009.

- Finalist, 2006 University of Kentucky Provost's Award for Outstanding Teaching.

- RNA Society Poster Award. Gordon Conference on RNA Editing. Ventura, California. 1999.

- Regents Dissertation Fellowship. University of California, Irvine. 1998.

- NIH Training Grant: Synthesis and Structure of Biological Macromolecules. University of California, Irvine. 1995-1997.

IV. Research Funding

Extramural Funding, Nationally Competitive

1. Shielding cucurbit crops for resilient agroecosystems. USDA Sprecialty Crops Research Initiative. Overall project PI: Mark Gleason, Iowa State University. University of Kentucky PI: Tim Coolong, Co-PI: **Mark Williams**, Co-PI: Ric Bessin. Total Project funding: $1,552,870. UK subcontract: $164,519 for two years starting October 2012.

2. Incorporating Row Covers into Muskmelon IPM with a Farming Systems Approach. USDA Pest Management Alternatives Program. Multi-state project. Overall project PI: Mark Gleason, Iowa State University. University of Kentucky PI: **Mark Williams**, Co-PI: Tim Coolong, Co-PI: Ric Bessin. Total Project funding: $200,000. UK subcontract: $76,000 for three years starting September 2011.
3. Globalizing Agricultural Education: Sustainable Agriculture, Food and Rural Development. USDA/NIFA International Science and Education Competitive Grants. PI: Keiko Tanaka, Co-PI: **Mark Williams**, Co-PI: Beth Goldstein, Co-PI: Carol Hanley. $150,000. 2010-2013
4. Sustainable Systems for Cucurbit Crops on Organic Farms. USDA Organic Agriculture Research and Extension Initiative. This is a multi-state project. Overall project PI: Mark Gleason, Iowa State University. University of Kentucky PI: **Mark Williams**, Co-PI: Tim Coolong, Co-PI: Ric Bessin. Total Project funding: $1,047.024. UK subcontract: $276,448 for three years starting July 2009.

5. A Training Program in Sustainable Vegetable Production for Extension Personnel in Kentucky and Tennessee. USDA Southern SARE Professional Development Program. PI: Timothy Coolong, Co-PI: **Mark Williams**, Co-PI: Kenny Seebold, Co-PI: Ricardo Bessin, Co-PI: Annette Wszelaki (University of Tennessee), Co-PI: Michael Bomford (Kentucky State University). $59,532 for 1 year starting July 2010.

6. Engaging Agricultural and Non-Agricultural Students in an Interdisciplinary Curriculum for Sustainable Agriculture. United States Department of Agriculture - Higher Education Challenge Grants Program. PI: **Mark Williams**, Co-PI: Mike Mullen, Co-PI: Larry Grabau, Co-PI: Victoria Bhavsar. $141,274 for 3 years, starting July 2005.

7. Chloroplast-Localized N-Terminal Protein Processing by Peptide Deformylase. National Science Foundation. PI: Lynnette Dirk, Co-PI: **Mark Williams**, Co-PI: Robert Houtz, Co-PI: Anne Francis-Miller. $300,000 for 3 years, starting January 2003.

Extramural Funding, Regionally Competitive

1. Optimizing No-Till Vegetable Production Systems for Organic Growers. PI: Krista Jacobsen, Co-PI: Tim Coolong, Co-PI: **Mark Williams**. Kentucky Department of Agriculture Specialty Crops Block Grant Organic Pest Management Program. $20,000. 2010-2012.
2. Optimizing Orchard Management Strategies for Yield, Plant Health, and Fruit Quality in Organic Apple Production. PI: Doug Archbold, Co-PI: **Mark Williams,** Co-PI: John Strang,

Co-PI: Ric Bessin. Kentucky Department of Agriculture Specialty Crops Block Grant Organic Pest Management Program. $73,425. 2010-2012.

3. Developing Diversified High Tunnel Systems to Enhance Food Security and Specialty Crop Production in Kentucky. PI: Krista Jacobsen, Co-PI: Tim Coolong, Co-PI: **Mark Williams.** Kentucky Department of Agriculture Specialty Crops Block Grant Program. $62,834. 2011-2013.
4. Fostering Research in Teaching and Learning in Sustainable Agriculture. Kentucky EPSCoR Conference Award. Kentucky Council on Post-Secondary Education. PI: Krista Jacobsen, Co-PI: Mark Williams. $2,665. 2011.
5. Isolation and Identification of Plant-Specific Peptide Deformylase Inhibitors from Soil Microorganisms for Use as Broad-Spectrum Herbicides and Selectable Markers. Kentucky Science and Engineering Foundation. PI: Robert L. Houtz, Co-PI: **Mark A. Williams**, Co-PI: Robert B. Grossman, Co-PI: Elisa M. D'Angelo, Co-PI: David W. Rodgers. $19,976. 2007-2009.
6. Database Design and Usability Testing for Advanced Digital Information Systems in Horticulture. Kentucky Science and Technology Corporation. PI: **Mark Williams**. $269,018 for 22 months, starting November 2002.

Extramural Funding, Internally Competitive

1. Developing Optimized Sustainable Organic Production Systems for Kentucky. USDA Special Grant: New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Tim Coolong, Co-PI: Krista Jacobsen. $50,003 for 2 years starting January 2010.

2. Developing an Optimized Organic Production System to Control Cucumber Beetles in Cucurbits. USDA Special Grant: New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Tim Coolong, Co-PI: Ric Bessin, Co-PI: Paul Vincelli. $55,000 for 3 years, starting July 2008.

3. Developing an Optimized Production System for Fresh Market Sweet Onion Production in Kentucky. USDA Special Grant: New Crops Opportunity Center, University of Kentucky. PI: Tim Coolong, Co-PI: **Mark Williams**. $33,107 for 3 years starting June 2009

4. Organic Grape Production for Kentucky. USDA Special Grant: New Crops Opportunity Center, University of Kentucky. PI. Patsy Wilson, Co-PI Krista Jacobsen, Co-PI: **Mark Williams**. $20,000 for three years staring June 2011.

5. Developing Optimized Organic Production Systems for Leafy Greens in Kentucky. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Brent Rowell. $17,000 for 3 years, starting June 2006.

6. Evaluation of Natural Sprays for Control of Economically Important Foliar and Fruit Diseases of Tomato and Cucurbits. New Crops Opportunity Center, University of Kentucky. PI: Paul Vincelli, Co-PI: **Mark Williams**, Co-PI: Ric Bessin, Co-PI: Kenny Seebold. $23,667. 2009-2012.

7. Sustainable/Organic Production Systems. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Krista Jacobsen. $50,003. 2010-2011.

8. Isolation and Identification of Plant-Specific Peptide Deformylase Inhibitors from Soil Microorganisms for Use as Broad-Spectrum Herbicides and Selectable Markers. University of Kentucky Natural Products Alliance PI: Robert L. Houtz, Co-PI: **Mark A. Williams**, Co-PI: Robert B. Grossman, Co-PI: Elisa M. D'Angelo, Co-PI: David W. Rodgers. $37,500 for 1 year, starting January 2007.

9. Organic Apple Orchard Establishment. New Crops Opportunity Center, University of Kentucky. PI: Douglas Archbold, Co-PI: **Mark Williams**, Co-PI: John Strang, Co-PI: John Hartman, Co-PI: Paul Vincelli, Co-PI: Ric Bessin. $48,800 for 2years, starting April 2007.

10. Evaluating the Sustainability of Two Widely Used Organic Vegetable Production Systems and Their Potential Use in Kentucky. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Brent Rowell, Co-PI: Elisa D'Angelo, Co-PI: Mike Bomford (Kentucky State University). $70,719 for 3 years, starting June 2005.

11. Developing an Organic Farming Research and Education Center: An Experiential Learning Opportunity. Barnhart Fund for Excellence, University of Kentucky. PI: **Mark Williams**. $500 for 1 year, starting January 2005.

12. Evaluating Crop and Soil Fertility Changes during Transition to an Organic Vegetable Production System. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Brent Rowell, Co-PI: Mike Mullen. $71,000 for 3 years, starting August 2004.

13. Understanding the Efficacy of and Improving Tolerance to Peptide Deformylase Inhibitors in Transgenic Tobacco. Kentucky Tobacco Research Development Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Lynnette Dirk. $109,041 for 2 years, starting July 2004.

14. Development of Organic Production Systems for Horticultural Crops in Kentucky. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Brent Rowell. $70,039 for 3 years, starting August 2003.

15. Evaluation of Cultural Practices for Container Production of Tropical Flowering Woody Vines in Kentucky. New Crops Opportunity Center, University of Kentucky. PI: **Mark Williams**, Co-PI: Robert Geneve. $69,020 for 3 years, starting August 2002.

16. Peptide Deformylase in Tobacco: A Novel Herbicide Target Amenable to Genetically Engineered Tolerance. Tobacco and Health Research Institute, University of Kentucky. PI: **Mark Williams**, Co-PI: Robert Houtz, Co-PI: Lynnette Dirk. $102,000 for 2 years, starting July 2001.

17. Comparative Horticultural Performance of Serviceberry (*Amelanchier* sp.) cultivars in Kentucky. University of Kentucky Nursery/Landscape Fund. PI: **Mark Williams**. $4,000 for 2 years, starting June 2003.

18. Examination of Herbicide/Mulch Interactions in Landscape Plantings. University of Kentucky Nursery/Landscape Fund. PI: **Mark Williams**, Co-PI: Robert McNiel. $3,500 for 2 years, starting June 2001.

19. Evaluation of Cultural Practices for Container Production of Passion Flowers. University of Kentucky Nursery/Landscape Fund. PI: **Mark Williams**, PI: Robert Geneve. $1,000 for 1 year, starting May 2001.

Non-competitive Funding

1. Examination of Herbicide/Mulch Interactions in Landscape Plantings. Syngenta Crop Protection. PI: **Mark Williams**. $3,000 for 2 years, starting June 2001.

Hatch Funding

1. Peptide Deformylase: A Novel Herbicide Target Amenable to Genetically Engineered Tolerance. PI: **Mark Williams**. United States Department of Agriculture Cooperative State Research Education and Extension Service - Hatch Project. Funding period: October 2002 – September 2007.

2. Developing Optimized Organic Production Systems for Cucurbits and Apples. PI: **Mark Williams**. United States Department of Agriculture Cooperative State Research Education and Extension Service - Hatch Project. Funding period: October 2008-2013.

V. Patents

1. US Patent Number 7,745,693. Inhibitors of Plant Peptide Deformylase for Use as Broad-Spectrum Herbicides and Method for Identifying the Same. Inventors: Robert L. Houtz, Lynnette M.A. Dirk and **Mark A. Williams**. Issued June 29, 2010.

2. US Patent number 7,445,923. Crystallization and Structure of a Plant Peptide Deformylase. Inventors: Robert L. Houtz, David Rodgers, Lynnette M.A. Dirk, and **Mark A.Williams**. Issued November 4, 2008.

3. US Patent Number 7,419,815 B2. Inhibitors of Plant Peptide Deformylase for Use as Broad-Spectrum Herbicides and Method for Identifying the Same. Inventors: Robert L. Houtz, Lynnette M.A. Dirk and **Mark A. Williams**. Issued September 2, 2008.

VI. Publications

Peer Reviewed Journal Articles

1. Ye Xia, Eliana Greissworth, Curtis Mucci, **Mark A. Williams**, Seth DeBolt. Characterization of culturable bacterial endophytes of switchgrass (Panicum virgatum L.) and their capacity to effect plant growth. *Global Change Biology Bioenergy*. 2012. Published online September 7th. DOI: 10.1111/j.1757-1707.2012.01208.x

2. Krista L. Jacobsen, Kim L. Niewolny, Michelle S. Schroeder-Moreno, Mark Van Horn, Alison H. Harmon, Yolanda H. Chen Fanslow, **Mark A. Williams**, and Damian Parr. 2012. Sustainable Agriculture Undergraduate Degree Programs: A Land Grant University Mission. *Journal of Agriculture, Food Systems, and Community Development.* Vol. 2 (3) pp 13-26.

3. Mark Keating, Victoria Bhavsar, Herbert Strobel, Larry Grabau, Michael Mullen, **Mark Williams.** 2010. Engaging Agriculture and Non-Agriculture Students in an Interdisciplinary Curriculum for Sustainable Agriculture. *NACTA Journal*. Vol. 54 (4) pp 24-29.

4. Dirk, M. A., Schmidt, J., Cai, Y., Barnes, J., Hanger, K., **Williams, M**., Grossman, R., Houtz, R., Rodgers, D. 2008. Insights into substrate specificity of plant peptide deformylase, an essential enzyme with potential for the development of novel biotechnology applications in agriculture. *Biochemical Journal.* Vol. 413(3): 417-427.

5. Derek Law, John Snyder, **Mark Williams.** 2008. Evaluating Solarization and Cultivated Fallow for Johnsongrass (Sorghum halapense) Control and Nitrogen Cycling on an Organic Farm. *Biological Agriculture & Horticulture.* Vol. 26(2): 175-191.

6. **Mark Williams**. 2007. Global Development of Organic Agriculture. Book Review. *Crop Science*, Vol 47. pg. 428

7. Cai-Xia Hou, Lynnette M. Dirk, Sitakanta Pattanaik, Narayan C. Das, Indu B. Maiti, Robert L. Houtz and **Mark A. Williams.** 2007. Plant Peptide Deformylase: A Novel Selectable Marker and Herbicide Target Based on Essential Co-Translational Protein Processing. *Plant Biotechnology Journal.* Vol. 5(2): 275-281. *Cover Article*.

8. Cai-Xia Hou, Lynnette M. Dirk and **Mark A. Williams**. 2006. Metabolism of the Peptide Deformylase Inhibitor Actinonin in *Nicotiana tabacum*. *WeedScience*. Vol. 54(2): 246-254.

9. Derek Law, John Snyder, Brent Rowell and **Mark A. Williams**. 2006. Weed Control Efficacy of Organic Mulches in Two Organically-Managed Bell Pepper Production Systems. *HortTechnology*. Vol. 16(2): 225-232.

10. Stephen Berberich, John Snyder, Robert Geneve and **Mark Williams**. 2006. Growth and Flowering Response of Container Grown Passion Flower Cultivars to Fertilizer and Paclobutrazol. *Journal of Environmental Horticulture*. Vol. 24(2) 109-114.

11. Cai-Xia Hou, Lynnette M.A. Dirk and **Mark A. Williams.** 2004. Inhibition of peptide deformylase leads to a decrease of D1 protein synthesis and a disassembly of PSII complexes in *Nicotiana tobacum*. *The American Journal of Botany*. 91 (9): 1304-1311.

12. Randy D. Dinkins, Heather M. Conn, Lynnette M.A. Dirk, **Mark A. Williams** and Robert L. Houtz*. 2003. The *Arabidopsis thaliana* peptide deformylase 1 protein is localized to both mitochondria and chloroplast. *Plant Science*. 165:751-758.

13. Lynnette M.A. Dirk, **Mark A. Williams** and Robert L. Houtz. 2002. Specificity of Chloroplast-Localized Peptide Deformylases as Determined with Peptide Analogs of Chloroplast-Translated Proteins. *Archives of Biochemistry and Biophysics*. 406:135-141.

14. Lynnette M.A. Dirk, **Mark A. Williams** and Robert L. Houtz. 2001. Eukaryotic Peptide Deformylases: Nuclear-Encoded and Chloroplast-Targeted Enzymes in Arabidopsis. *Plant Physiology*. 127: 97-107. *This was a featured article.*

15. **Williams M.A.**, Yasuyo Johzuka and R. M. Mulligan. 2000. Addition of Nongenomically Encoded Nucleotides to the 3' Terminus of Maize Mitochondrial mRNAs: Truncated *rps12* mRNAs Frequently Terminate with CCA. *Nucleic Acids Research*. 28(22): 4444-51.

16. Mulligan R.M., **Williams M.A.** and M.T. Shanahan 1999. RNA Editing Site Recognition in Higher Plant Mitochondria. *Journal of Heredity.* 90(3): 338-344.

17. **Williams M.A.**, Tallakson W.A., Phreaner C.G. and R.M. Mulligan. 1998. Editing and Translation of Ribosomal Protein S13 Transcripts: Unedited Translation Products are not Detectable in Maize Mitochondria. *Current Genetics.* 34: 221-226.

18. **Williams M.A.**, Kutcher B.M. and R.M. Mulligan. 1997. Editing Site Recognition in Plant Mitochondria: The Importance of 5' Flanking Sequences. *Plant Molecular Biology* 36: 229-237.

19. Phreaner C.G., **Williams M.A.** and R.M. Mulligan. 1996. Incomplete Editing of *rps12* Transcripts Results in Polymorphic Gene Expression in Maize Mitochondria. *Plant Cell.* 8:107-117. *This was a featured article.*

Invited Book Chapters (Peer Reviewed)

1. Tanaka, K., **M. Williams**, K. Jacobsen, and M. Mullen. 2011. Sustainably Growing Farmers of the Future: Undergraduate Curriculum in Sustainable Agriculture at the University of Kentucky." In K. Bartels and K. Parker (eds.), *Teaching Sustainability and Teaching Sustainably in Higher Education*. Sterling, VA: Stylus Publishing.

2. **Mark Williams** and Audrey Law. 2008. Compost, Neem Oil, Pastured Poultry Production, and *Bacillus thuringiensis*. These sections were written for *The Encyclopedia of Organic, Sustainable and Local Food.* Duram, L (Ed.). Greenwood Press.

3. Cai-Xia Hou and **Mark A. Williams**. 2006. Actinonin-Induced Inhibition of Plant Peptide Deformylase: A Paradigm for the Design of Novel Broad-Spectrum Herbicides In *Natural*

Products for Pest Management. Rimando, A.M.; Duke, S.O. (Eds.), *American Chemical Society Symposium Series*, 927:243-254.

Invited International Conference Proceedings

* denotes who made the presentation

1. **Mark A. Williams*** , Lynnette M. A. Dirk and Robert L. Houtz. 2002. Chloroplast-localized Peptide Deformylase: A New Target for the Development of Novel Broad-Spectrum Herbicides. 10th IUPAC International Congress on the Chemistry of Crop Protection. Basel, Switzerland. August 2002. p. 166.

2. Robert L. Houtz* , Lynnette M.A. Dirk, **Mark A. Williams** and Brent W. Meier. 2000. Primary and Secondary Structural Elements Influence the Susceptibility of the Rubisco Small Subunit to Methylation by Rubisco Small Subunit Methyltransferase. 5th International Jubilee Conference on the Role of Formaldehyde in Biological Systems: Methylation and Demethylation Processes. Sopron, Hungary. p. 31.

Conference Proceedings

1. Berberich, S* ., Geneve, R. and **M. Williams.** 2003. Growth and Flowering of Passion Flower Cultivars Varies in Response to Fertilizer Concentration. Southern Nursery Association Research Conference Proceedings. 48:103-106.

2. Berberich, S.* , **Williams, M.** and R. Geneve. 2002. The Effect of Fertilizer Concentration on Shoot Length, Biomass, and Flower Number in Container Produced Passion Flowers. Southern Nursery Association Research Conference Proceedings. 47:111-114.

3. **Mark A. Williams*** , Lynnette M. A. Dirk and Robert L. Houtz. 2002. Characterization and Inhibition of Chloroplast-localized Peptide Deformylases from *Arabidopsis thaliana.* Proceedings of the Southern Weed Science Society. p. 193.

4. **Williams, M.A**.* , Dirk, L.M.A. and R.L. Houtz. 2000. Characterization of a Chloroplast-Localized Peptide Deformylase from *Arabidopsis thaliana*. Plant Physiology. 123: S-131. Abstract.

Research Reports

1. Mark Williams and Delia Scott. 2011. The Impact of Row-Cover Placement for the Organic Production of Muskmelon and Butternut Squash in Kentucky. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-626). pp. 36-38.

2. Delia Scott, Mark Williams, Doug Archbold ad John Strang. 2010. Organic Apple Production Update. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-603). pp. 17-18.

3. Derek Law, Mark Williams and Timothy Coolong. 2008. Producing No-Till Pumpkins with a Rye/Vetch Cover-Crop in Kentucky with Conventional, Low-Input, and Organic Practices. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-572). pp. 51-53.

4. Derek Law and Mark Williams. 2008. Organic Small Fruit Production Using Haygrove Tunnels: Second-Year Update and Raspberry Production Yield Information. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-572). pp. 28-30.

5. Derek Law, John Strang, Amy Poston, John Snyder, Mark Williams, Chris Smigell, and Darrell Sloane. 2008. High Tunnel and Field Plasticulture Strawberry Evaluation. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-572). pp. 27-28.

6. Derek Law[§], and **Mark Williams**. 2007. Optimizing Organic Culture of Select Small Fruits in Kentucky Using Haygrove Tunnels. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-521). pp. 47-49.

7. Derek Law[§], John Strang, John Snyder, Chris Smigell, Darrell Sloane, and **Mark Williams**. 2007. High Tunnel and Field Plasticulture Strawberry Evaluation. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-521). pp. 46-47.

8. Derek Law[§], John Strang, Doug Archbold, and **Mark Williams**. 2007. Establishment of an Organic Apple Orchard at the UK Horticulture Research Farm. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-521). pp. 52-54.

9. Derek Law[§], and **Mark Williams**. 2007. Spring Greens and Lettuce Variety Evaluations. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-521). pp. 56-61.

10. Derek Law, Brent Rowell, John Snyder and **Mark Williams**. 2005. Solarization and Cultivated Fallow for Weed Control on a Transitioning Organic Farm. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-521). pp. 81-84.

11. S. Berberich, R. Geneve and **M. Williams**. 2004. Effect of Planting Date and Protective Structures on Finishing Date for Container-Produced Passiflora 'Lady Margaret". *University of Kentucky Nursery and Landscape Program* (PR-502). pp 9-10.

12. Derek Law, John Snyder, Brent Rowell and **Mark Williams**. 2004. Weed Control Management Systems for Organically Grown Bell Peppers. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-504). pp. 48-49.

13. Derek Law, Brent Rowell and **Mark Williams**. 2003. Development of Organic Production Systems for Kentucky Horticultural Crops. *University of Kentucky Fruit and Vegetable Crops Research Report* (PR-488). p. 94.

14. S. Berberich, R. Geneve and **M. Williams**. 2003. Pinching of Passiflora 'Lady Margaret' and 'Amethyst' Reduces Shoot Number and Delays Flowering. *University of Kentucky Nursery and Landscape Program* (PR-486). pp. 8-9.

15. S. Berberich, **M. Williams** and R. Geneve. 2002. Evaluation of Cultural Practices for Container Production of Passion Flowers. *University of Kentucky Nursery and Landscape Program Research Report* (PR-468). pp.12-13.

16. R. Geneve, **M. Williams** and S. Kester. 2001. Container Production of Passion Flower. *University of Kentucky Nursery and Landscape Program Research Report* (PR-450). pp. 10-11.

Abstracts Presented Before Professional Societies

* denotes who made the presentation

1. Logan M. Minter*, Ricardo T. Bessin, Timothy Coolong, and **Mark A. Williams**. Entomogical Society of America National Conference. Balancing pest and pollinator management in cucurbit production systems. 2011. Nov. 13-16, Reno, NV.

2. Minter, L*., and R Bessin, A. Alesch, D. Scott, **M. Williams**, T. Coolong, and D. Biddinger. ESA National Conference. Results of native pollinator diversity surveys on Kentucky vegetable farms. 2011. Dec. 12-15, San Diego CA.

3. Shawn Lucas*, Elisa D'Angelo, **Mark Williams.** Soil Science Society of America. Organic Soil Amendments and their affect on Soil Microbial and Physical Properties. Long Beach CA. November 2010.

4. **Mark A. Williams**. 2008. Engaging Agriculture and Non-Agriculture Students in an Interdisciplinary Curriculum for Sustainable Agriculture. NACTA/SERD Conference. Logan UT, June 2008.

5. Cai-Xia Hou*, Lynnette M.A. Dirk and **Mark A. Williams.** Metabolism of the Peptide Deformylase Inhibitor Actinonin in *Nicotiana tabacum*. American Society of Plant Biologists Meeting. Seattle, WA. July 16- 20, 2005.

6. Derek Law*, Brent Rowell and **Mark Williams**. Weed Control Efficacy of Organic Mulches in Two Organically Managed Bell Pepper Production Systems. American Society of Horticultural Science National Meeting. Las Vegas, NV. July 18-21, 2005

7. Cai-Xia Hou*, Heather M. Conn, Lynnette M.A. Dirk, Robert L. Houtz and **Mark A. Williams**. Genetically Engineered Tolerance to a Peptide Deformylase Inhibitor in Tobacco. American Society of Plant Biologists Meeting. Lake Buena Vista, Florida. July 2004.

8. Mark **A. Williams**, Robert L. Houtz and Lynnette M.A. Dirk*. Peptide Deformylase: Site-Directed Mutation Directed Towards Engineering Inhibitor Resistance. American Society of Plant Biologists Meeting. Lake Buena Vista, Florida. July 2004.

9. **Mark A Williams***, Lynnette M. A. Dirk and Robert L. Houtz. Production of Transgenic Tobacco with Engineered Resistance to Inhibitors of Plant Peptide Deformylase. International Horticulture Congress. Toronto, Canada. August 2002.

10. Heather Conn*, Randy Dinkins, Lynnette Dirk, Robert Houtz and **Mark Williams**. Subcellular Localization of Plant Peptide Deformylase. Annual Society of Plant Biology Meeting. Denver, CO. August 2002.

11. R. L. Houtz, Dirk*, L.M.A. and **M.A. Williams**. Specificity of Chloroplast-localized Peptide Deformylases as Determined with N-Terminal Peptide Analogs of Chloroplast-Translated Proteins. Annual Society of Plant Biology Meeting. Denver, CO. August 2002.

12. **Mark A. Williams***, Lynnette M. A. Dirk and Robert L. Houtz. 2002. Chloroplast-localized Peptide Deformylase: A New Target for the Development of Novel Broad-Spectrum Herbicides. Weed Science Society of America Annual Meeting. Reno, NV. February 2002.

13. **Mark A. Williams***, Lynnette M. A. Dirk and Robert L. Houtz. 2002. Characterization and Inhibition of Peptide Deformylases from *Arabidopsis thaliana.* Southern Weed Science Society of America Annual Meeting. Atlanta, GA. January 2002.

14. **Mark A. Williams***, Lynnette M. A. Dirk and Robert L. Houtz. Characterization and Inhibition of Chloroplast-localized Peptide Deformylases from *Arabidopsis thaliana.* American Society of Horticultural Science Conference and Exhibition. Sacramento, CA. July 2001.

15. Lynnette M.A. Dirk*, **Mark A. Williams** and Robert L. Houtz. Post-Translational Modifications in the Rubisco SS: Influence of Methionines on the Methylatability of the N-Terminal α-Amino Group. Annual Society of Plant Physiology Meeting. San Diego, CA. July 2000.

16. **Williams, M.A.***, Dirk, L.M.A. and R. L. Houtz. Characterization of a Chloroplast-localized Peptide Deformylase from *Arabidopsis thaliana.* Annual Society of Plant Physiology Meeting. San Diego, CA. July 2000.

17. **Williams, M.A.***, Kutcher, B.M. and R.M. Mulligan. Identification of an Antisense RNA to the 5' Flanking Region of a Maize Mitochondrial Editing Site. Gordon Conference on RNA Editing. Ventura, CA. January 24-29, 1999.

18. **Williams, M.A.***, Kutcher, B.M. and R.M. Mulligan. Recombination Near Editing Sites Affects Editing Site Recognition. Gordon Conference on RNA Editing. Ventura, CA. January 19-24, 1997.

19. Mulligan, R.M.*, Phreaner, C.G., **Williams M.A.** and W. A. Tallakson. Incomplete Editing Results in Polymorphic Gene Expression in Plant Mitochondria. Gordon Conference on RNA Editing. Ventura, CA. January 19-24, 1997.

20. **Williams, M.A.***, Kutcher, B.M. and R. M. Mulligan. Recombination Near Editing Sites Affects Editing Site Recognition. UC Riverside Conference, January 16-18, 1997.

21. Mulligan, R.M.*, Phreaner, C.G., **Williams M.A.** and W. A. Tallakson. Incomplete Editing Results in Polymorphic Gene Expression in Plant Mitochondria. UC Riverside Conference, January 16-18, 1997.

22. Mulligan R.M.*, Phreaner C.G., **Williams M.A.** and W. A. Tallakson. Incomplete Editing Results in Polymorphic Gene Expression in Plant Mitochondria. EMBO Workshop on RNA Editing. Maastricht, Netherlands. September 1996.

23. Phreaner C.G., **Williams M.A.** and R.M. Mulligan*. *rps12* in Maize Mitochondria: One Gene; Six Editing Sites; Many mRNAs; How Many Proteins? Plant Mitochondria; From Gene to Function. Duke University, NC. April 1995.

24. Phreaner C.G., **Williams M.A.** and R.M. Mulligan*. *rps12* in Maize Mitochondria: One Gene; Six Editing Sites; Many mRNAs; How Many Proteins? RNA Editing: An Evolving Mechanism of Gene Regulation at the 1994 Albany Conference. Rensselaerville, NY. October 1994.

VII. Invited Speaker Presentations

International

1. University of Development Studies, Tamale, Ghana Africa. *Sustainable Agriculture Education and Research at the University of Kentucky*. January 2011. Part of the Norman Borlaug Mentor Program.

2. Malang University, Malang, Indonesia. *Development of a Curriculum in Sustainable Agriculture at a United States Land Grant University*, *Community Supported Agriculture: A Novel Marketing Trend*. June 2009.

3. Maejo University, Chiang Mai Thailand. *Sustainable Agriculture and International Internships at the University of Kentucky*. January 2008.

4. Slow Food Terra Madre International Meeting of Food Communities. *Development of a Novel Curriculum in Sustainable Agriculture at the University of Kentucky*. Torino, Italy. October 2006.

5. International Horticulture Congress Meeting. *Chloroplast-localized Peptide Deformylase: A New Target for the Development of Novel Broad-Spectrum Herbicides*. Toronto, Canada. August 2002.

National

1. TN Fruit and Vegetable Conference. *Organic Vegetable Production*. Jan. 21, 2011, Nashville, TN

2. Extension Agent training: Organic and Sustainable Vegetable Production: Weed Management, June 16, Lexington KY, Aug. 19, 2010. Knoxville, TN.

3. ASHS National Meeting, *Engaging Agriculture and Non-Agriculture Related Students in a Multidisciplinary Curriculum in Sustainable Agriculture*. St. Louis, MO. July, 2009

4. Southern SAWG General Conference. *Bettering Black Plastic: Alternative Practices for Reducing Negative Impacts*. Wilhoit, J., Coolong, T., and Williams, M., Jan. 23, 2009, Chattanooga, TN

5. TN Fruit and Vegetable Conference. *Organic Vegetable Production, Organic Weed Management*. Jan. 21, 2009, Nashville, TN

6. Texas A & M, College Station, Texas. *UK Sustainable Agriculture Curriculum: Development and Current Status*. February 2009.

7. UT Knoxville. Knoxville, TN. *UK Sustainable Agriculture Curriculum: Development and Current Status*. March 2009.

8. Southern Weed Science Society Annual Meeting – *Organic Weed Management Symposium. Evaluation of Weed Control Practices in an Organic Bell Pepper Production System*. Memphis, TN. January 27, 2004.

9. American Chemical Society Meeting – Natural Products for Pest Management Symposium. *Actinonin-Induced Inhibition of Plant Peptide Deformylase: A Paradigm for the Design of Novel Broad-Spectrum Herbicides*. Anaheim, CA. March 2004.

10. American Arboretum and Botanical Gardens Association Annual Meeting. *Database Design and Usability Testing for Advanced Digital Information Systems in Horticulture*. Boston, MA. June 2003.

Regional/Local

1. KY Healthy Food Local Farms Conference. *Trends in Sustainable Agriculture in Academic Institutions in Kentucky*. Plenary Panel Moderator. Louisville, KY. November 2011.

2. UK Final Word Seminar Series. *Sustainable Agriculture: The Final Word*. University of Kentucky. November 2011.

3. Girls STEM NSF Collaborative presentation. *Math in Agriculture*. Lexington. August 2010.

4. Keynote Panel Speaker: Campus Community Partnership for Sustainability. *The Future of Agriculture in Kentucky: A Vision of Sustainability*. Lexington, KY. April 2010.

5. Kentucky Environmental Educators Association Conference. *Using the Horticulture Research Farm as a Field Destination*. Shakertown, October 25, 2008.

6. Kentucky Slow Foods Association Annual Meeting. *Reflections on Terra Madre*. Woodford Reserve Distillery. January 13, 2007.

7. Growing Kentucky II Symposium. *Development of the UK Sustainable Agriculture Curriculum*. Lexington. March 13, 2007.

8. Kentucky Fruit and Vegetable Grower's Association Annual Meeting. *Northeast U.S. Commercial Organic Farming Update*. Lexington, KY. January 2006.

9. Live Television Presentation, WKYT. *Status of Organic Agriculture in Kentucky and in the UK College of Agriculture*. Lexington, KY. February 24, 2005.

10. Kentucky Landscape Industries 2005 Winter Trade Show and Conference. *Weed Management in Nursery and Landscape Plantings*. Louisville, KY. January 10, 2005.

11. Kentucky Landscape Industries 2004 Winter Trade Show and Conference. *Weed Management in Nursery and Landscape Plantings*. Louisville, KY. January 7, 2004.

12. Best Management Practices Workshop 4. *Mulch and Herbicides*. Princeton, KY. February 18, 2003.

13. Kentucky Landscape Industries 2003 Winter Trade Show and Conference. *The Biology and Control of Selected Landscape Weeds*. Louisville, KY. January 9, 2003.

14. Kentucky Landscape Industries 2002 Winter Trade Show and Conference. *The Biology and Control of Six Common Winter Annual Weeds*. Lexington, KY. January 10, 2002.

15. Kentucky Landscape Industries 2002 Winter Trade Show and Conference. *Herbicide/Mulch Interactions in Landscape Plantings*. Lexington, KY. January 10, 2002.

16. Turf and Landscape Management Short Course. *Herbicide/Mulch Interactions in Landscape Plantings*. Louisville, KY. February 21, 2002.

17. Kentucky Tobacco Research and Development Center. *Chloroplast-localized Peptide Deformylase: A New Target for the Development of Novel Broad-Spectrum Herbicides*. Lexington, KY. November 8, 2002.

18. Kentucky Landscape Industries 2001 Winter Trade Show and Conference. *The Biology and Control of Six Common Winter Annual Weeds*. Lexington, KY. January 5, 2001.

VIII. Service and Recognition

- Manuscript reviewer for The Journal of Soil Science, Horticulture Science, HortTechnology and Biological Agriculture and Horticulture.

- Co-organizer for the Sustainable Agriculture Education Association (SAEA) national meeting. This meeting was held at UK and attended by over 200 educators and students from across the United States and abroad. August 2011.

- Featured in the *UK at The Half* radio show. Interviewed by Carl Nathe to discuss the future of Kentucky Agriculture and how sustainability fits in. November 2010.

- Conference Steering/Planning Committee Member, Campus Community Partnership for Sustainability Conference. Lexington KY. 2010.

- Organized and lead the effort for the "2010 Chef's Afield Event" at the Organic Farming Research and Education Unit. October.

- Filmed for KET episode: "Chef's Afield and Sustainable Agriculture." October, 2010.

- Elected to the University Senate for a three-year term starting August 2009.

- Filmed for Gourmet Magazine's "Diary of a Foodie." This television show was internationally shown on the National Geographic Network and highlighted my philosophies on organic farming and the SAG curriculum. August 2007.

- Filmed for UK Extension on Air episodes: "Making Farming Tools of the Past, New Again," and "Community Supported Agriculture." October, September 2007.

- Organized and Hosted the 2006 "Chefs Afield" meeting at the University of Kentucky Horticulture Research Farm, October 2006.

- Established a committee to develop a local foods buying program for the University of Kentucky dining services. A pilot program occurred during Fall 2006 where several different produce items were purchased from local growers for a three month period. The program was successful and evolved into the current local foods buying program at the university, which is one of the largest in the United States.

- Featured in the Fall 2006 University of Kentucky College of Agriculture Magazine, "Sustainable Agriculture, So We Can Farm Forever."

- Member, grant review panel for the USDA - CSREES - Integrated Organic Program. Washington, D.C. August 2004. I was also invited to join the panel in 2005 but recused because I had a grant submitted to the program.

- Reviewer, Kentucky Tobacco Research and Development Center grant program, 2002 and 2005.

- Reviewer for the University of Kentucky, College of Agriculture Precision Resource Management Committee grant program, April 2004.

- Reviewer for the University of Kentucky, College of Agriculture Undergraduate Scholarships, 2003.

- Kentucky Arborist Association Education and Research Committee member. August 2004-present.

- Invited Judge for the 2002 Intel International Science and Engineering Fair, Weed Science Section. Louisville, KY. May 18, 2002.

- Invited Judge for the SCAPA Science Fair. Lexington, KY. February, 2008.

- Invited Judge for the Stonewall Elementary Science Fair. Lexington, KY. February 12, 2004.

IX. Research Advising

Graduate Student Advising

Major Advisor

1. Delia Scott, M.S. candidate, Plant and Soil Science Program. Project: Evaluating the Sustainability of Two Widely Used Organic Vegetable Production Systems and Their Potential Use in Kentucky. 2005-present.
2. Shawn Lucas, Ph.D. candidate, Crop Science Program. Project: Evaluation of Soil Microbial and Carbon Sequestration Parameters in Organically Managed Soils. August 2006-present.
3. Robert Caudle, Ph.D. candidate, Crop Science Program. Project: Developing an Optimized Organic Production System to Control Cucumber Beetles in Cucurbits. August 2008-present.
4. Stephen Berberich, M.S., Plant and Soil Science Program. Project: Evaluation of Cultural Practices for Container Production of Tropical Flowering Vines. Started August 2002. Graduated February 2005.
5. Derek Law, M.S.,Plant and Soil Science Program. Project: Development of Organic Production Systems for Horticultural crops in Kentucky. August 2003- Graduated April 2004.
6. Audrey Horrall, Ph.D. candidate, Plant and Soil Science Program. Project: Evaluation of Soil Biodiversity Changes in an Organic Production System. August 2003-Graduated December 2008.

7. Tony Silvernail, Ph.D. candidate, Plant and Soil Science Program. Project: Evaluation of Tillage Effects on Weed Seed Bank Changes in an Organic Production System. August 2003-July 2005 (withdrew for personal reasons).

Committee Member

1. Derrick Hammons, Ph.D. Entomology Program. Graduated October 2009.

2. Merari Feliciano-Rivera, Ph.D., Plant Pathology Program. Graduated May 2011

3. Amy Poston, M.S. , Plant and Soil Science Program. Graduated April 2007.

4. Marta Nosarzewski, Ph.D., Plant Physiology/Biochemistry/Molecular Biology Program. Graduated 2007.

5. Sowmya Sampath, Ph.D. Biochemistry Program. Graduated March 2008.

6. Kyung Myung, Ph.D. , Plant Physiology/Biochemistry/Molecular Biology Program. Graduated June 2007.

7. John Barnes M.S. Chemistry. Graduated June 2006.

8. Dan Kishnick, M.S. candidate, Plant and Soil Science Program. Graduated August 2005.

9. Elizabeth Bisby-Kuhn, M.S. candidate, Plant and Soil Science Program. 2003.

10. Todd Leeson, M.S. candidate, Plant and Soil Science Program. 2003-2004.

11. Brent Meier, Ph.D. candidate, Plant Physiology/Biochemistry/Molecular Biology Program. January 2001.

Other Graduate Advising

- Directed Jamie Dockery (M.S. candidate in Agriculture Education) in a PLS790 Independent Research project during the Spring 2008 semester.

- Directed three graduate students, Michael Hogan, Charlie Neal, and Delia Scott in PLS 790 Independent Research projects during the Fall 2006 semester.

Visiting Scholar Advising

- Directed and Advised Mildred Osei-Kwartang who was a Bourlag Institute Fellow from Ghana. Project: Post Harvest Handling of Organically Grown Sweet Potatoes. Summer-Fall 2009.

Post-Doctoral Scholars

- Major Advisor for Cai-Xia Hou, Ph.D. Project: Characterization and Inhibition of Chloroplast-Localized Peptide Deformylases. From the Department of Plant Physiology and Molecular Biology. University of Turku, Finland. March 1, 2002-June 2006.

X. Undergraduate Advising

Academic Advising

I advise undergraduate students in the Sustainable Agriculture, Agriculture Biotechnology and Horticulture Plant and Soil Science programs.

Undergraduate Research Advising

- Advised and mentored 3 students in Fall 2009 and 1 student in Fall 2010 on independent research projects (SAG 395) related to organic and sustainable farming.

- Advised and mentored Emily Brunner, an undergraduate in the Natural Resource Conservation Program. Project: Developing Precision Irrigation Systems for Organic Apple Orchards. Summer-Fall 2008.

- Advised and mentored Ben Abell, an undergraduate in the Natural Resource Conservation Program. Project: Evaluation of organic and conventional whole-farm management systems. Summer-Fall 2005.

- Advised and mentored Derrick Hammons, an undergraduate in the Plant and Soil Science Program. Project: Evaluation of early season organic cabbage production systems. Fall 2003-Spring 2004.

- Advised and mentored Brian Zamora, an undergraduate in the Agriculture Biotechnology program. Project: Construction and Evaluation of Transformed *Arabidopsis thaliana* Engineered for Resistance to Peptide Deformylase Inhibitors. Mr. Zamora was the recipient of two Undergraduate Research and Creativity Grants of $500 each during this project. January 2001- May 2002.

International Student Advising

- Advised and mentored 1 student from France, AgroSup Dijon (ENESAD), and 2 students from Meijo University in Thailand. These students all worked as Apprentices on our farm. 2009.

- Advised and mentored 1 student from Meijo University in Thailand. This student worked as Apprentices on our farm. 2010.

Other Advising

• Faculty Co-Advisor for 9 undergraduate students competing in the Associated Landscape Contractors of America (ALCA) Student Career Days. Columbus, OH. March 2004.

• Faculty Co-Advisor for 14 undergraduate students competing in the Associated Landscape Contractors of America (ALCA) Student Career Days. Jackson, Mississippi. March 2003.

• Faculty Co-Advisor for 14 undergraduate students competing in the Associated Landscape Contractors of America (ALCA) Student Career Days. Illinois Central College. Peoria, IL. March 20-24, 2002.

• Faculty Co-Advisor for the Horticulture Club Nursery/Arboreta tour in Oregon and Washington. March 8-17, 2002.

• Faculty Co-Advisor for 8 undergraduate students competing in the Associated Landscape Contractors of America (ALCA) Student Career Days. Colorado State University, Fort Collins, CO. March 8-11, 2001.

XI. Teaching and Instruction

Resident Instruction

- *PLS 404 - Integrated Weed Management, PLS 451 - Landscape Installation and Management*, *PLS 386 - Plant Production Systems, SAG 397 - Apprenticeship in Sustainable Agriculture, SAG 490 - Integration of Sustainable Agriculture Principles, SAG 395 - Independent Research in Sustainable Agriculture*

Teaching Improvement Activities

- Nominated to the college's Academy of Teaching and Learning (ATL) Scholars Program. January 2009-December 2010.

- Participated in the 2007 National Conference on Changing Higher Education in Agriculture and Related Sciences: From Dialogue to Action-Reinventing teaching and Learning. June 11-13, Texas A &M University.

- Participated in a workshop designed to teach instructors how to teach novel agriculture courses such as GEN 100 & 200. Workshop was facilitated by Dr. Larry Grabau of the Teaching and Learning Center. Course met weekly for 9 weeks during the fall semester, 2001.

- Participated in the 2006 Facilitating Sustainable Agriculture Education Conference. This conference was the first of its kind and was organized by faculty from the University of California Santa Cruz and University of California Davis. The conference was focused on developing resources for faculty involved in sustainable agriculture education. Asilomar, CA. January 2006.

Invited Teaching Related Presentations

- United States Department of Agriculture Southern Region Teaching Workshop, "Applying the Concepts of Sustainability in the Design and Construction of an Organic Farming Research and Education Center." Lexington, KY. August 10, 2005.

- NACTA-SERD Meeting, "Engaging Agriculture and Non-Agriculture Related Students in a Multidisciplinary Curriculum in Sustainable Agriculture" Logan, Utah. June 11-13, 2008

Other Teaching Related Activities

- Director of Undergraduate Studies for the Sustainable Agriculture Curriculum since its inception in Spring semester 2007.

- Co-lead week-long students trips to Los Angeles (8 students) in Fall 2007, New Mexico (10 students) in Spring 2008, and Arizona (8 students) in Spring 2009 to study sustainable agricultural systems and architecture.
- Co-lead an 18 day student trip to Thailand (11 students) in Summer 2008 as part of the UK education abroad program, and College of Agriculture Ambassador Program.
- Lead or Co-lead students on week –long organic farming and sustainable agriculture study tours to Upper North-East (6 students) in Spring 2011, Upper Mid-West (7 students) in Spring 2009, Southeast (5 students) in Spring 2010.
- Co-advisor: UK Slow Food Student Chapter. November 2010-present
- Committee member: College Undergraduate Curriculum Committee. Fall 2010-present.

XII. Committee Participation

National

- Sustainable Agriculture Education Association (SAEA) steering committee. 2006-2008.

- Sustainable Agriculture Education Association Conference Planning Committee. 2010-2011

State

- Education and Research Committee, Kentucky Arborist Association. August 2004-2006.

- Organic Certification Advisory Panel – Kentucky Department of Agriculture. January 2007-present.

University

- Co-Chair, President's Sustainability Advisory Committee. January 2008-2010.

- President's Sustainability Advisory Committee. January 2011-present.

- Sustainable Scholarly Learning Community Committee. 2009-2010.

College of Agriculture

- **Departmental:** Scholarship Committee (**Chair**), Undergraduate Education Committee, Graduate Studies Committee, Research Project Review Committee, Lexington Farm/Greenhouse Committee, Safety Committee.

- **College of Agriculture:** Sustainable Agriculture Curriculum Steering Committee (**Chair**), October 2005-2010. Associate Member in the Graduate Faculty for the Plant and Soil Science (M.S.) program, October 24, 2001-present. Associate Member in the Graduate Faculty for the Plant Physiology (Ph.D.) program, October 24, 2001-present. Associate Member in the Graduate Faculty for the Crop Science (M.S.) program, August, 2003-present.

XIII. Professional Development

I have made a concerted effort to expand my knowledge on all aspects of landscape management, with a particular emphasis on arboriculture. This information has allowed me to create a class focused on arboriculture (PLS451), and is used in many of my public presentations. As part of my self-edification in arboriculture, I obtained two of the highest internationally-recognized levels of achievement in arboriculture.

• International Society of Arboriculture (ISA) Certified Tree Worker/Climber Specialist. Obtained June 12, 2002.

• International Society of Arboriculture Certified Tree Worker Skills Exam Evaluator. Obtained June 12, 2002.

• Kentucky Arborist Association workshop "Evaluating Tree Defects." Completed June 21, 2002.

• ArborMaster Training Climbing Skills Module. Completed July 13, 2002.

XIV. Professional Affiliations

• Member of the Botanical Society of America (2004-present), American Society of Horticultural Science (2001-2003), Kentucky Arborist Association (2004-present), Weed Science Society of America (2003) International Society of Arboriculture (2002-present) and North American Colleges and Teachers of Agriculture (2006 - 2010).