

# Zachary Raymond King

## United Soybean Board Fellow and PhD Candidate

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### EDUCATION:

- PhD, Plant Breeding, Genetics and Genomics** **May 2011 – Expected May 2015**  
The University of Georgia, Athens GA  
GPA 4.00 / 4.00
- Master of Science, Plant Breeding, Genetics and Genomics** **May 2011**  
The University of Georgia, Athens GA  
GPA 3.82 / 4.00
- Plant Biotechnology Internship** **June 2009**  
University of Natural Resources and Applied Sciences, Vienna Austria  
GPA 4.00 / 4.00
- Bachelor of Science with Distinction, Biotechnology, Honors Thesis Program** **May 2008**  
State University of New York College of Environmental Science and Forestry (SUNY-ESF), Syracuse NY  
GPA 3.84 / 4.00 *Summa Cum Laude Honors*

### REFEREED PUBLICATIONS:

- Harris, D.K., M.D. Kendrick, **Z.R. King**, K.F. Pedley, D.R. Walker, P.B. Cregan, J.W. Buck, D.V. Phillips, Z. Li, and H.R. Boerma. Identification of Unique Genetic Sources of Soybean Rust Resistance from the USDA Germplasm Collection. Submitted to Crop Science.
- Neil, Y., M. Kim; **Z.R. King**, D.W. Harris, J. Buck, Z. Li, B. Diers. Fine mapping of the Asian soybean rust resistance gene *Rpp2* from soybean PI 230970. Submitted to Theoretical and Applied Genetics.
- King, Z.R.**, J. Serrano, H.R. Boerma, and Z. Li. 2014. Non-Toxic and Efficient DNA Extractions for Soybean Leaf and Seed Chips for High-Throughput and Large-scale Genotyping. Biotechnology Letters. DOI:10.1007/s10529-014-1548-8.
- Walker, D.R., D.K. Harris, **Z.R. King**, Li Z., H.R. Boerma, J.B. Buckley, D.B. Weaver, E.J. Sikora, E.R. Shipe, J.D. Mueller, J.W. Buck, R.W. Schneider, J.J. Marois, D.L. Wright, and R.L. Nelson. 2014. Evaluation of soybean germplasm accessions for resistance to *Phakopsora pachyrhizi* populations in the southeastern United States, 2009-2012. Crop Science. DOI:10.2135/cropsci2013.08.0513.
- Walker, D.R., D.K. Harris, **Z.R. King**, Z. Li, D.V. Phillips, J.W. Buck, R.L. Nelson, and H.R. Boerma. 2014. Reactions of soybean germplasm accession seedlings to soybean rust (*Phakopsora pachyrhizi*) isolates from Georgia. Crop Science. DOI:10.2135/cropsci2013.09.0654.
- King, Z.R.**, A.L. Bray, P.R. LaFayette, and W.A. Parrott. 2014. Biolistic transformation of elite genotypes of switchgrass (*Panicum virgatum* L.). Plant Cell Reports. 33:313-322.
- Mann, D.G.J., P.R. LaFayette, L.L. Abercrombie, **King Z.R.**, M. Mazarei, M.C. Halter, C.R. Pooviah, H. Baxter, H. Shen, R.A. Dixon, W.A. Parrott, and C.N. Stewart Jr. 2011. Gateway-compatible vectors for high-throughput gene functional analysis in switchgrass (*Panicum virgatum* L.) and other monocots. Plant Biotechnology Journal. 1–11 DOI:10.1111/j.1467-7652.2011.00658.x
- Mann, D.G.J., **Z.R. King**, W. Liu, B.L. Joyce, R.J. Percifield, J.S. Hawkins, P.R. LaFayette, B.J. Artelt, J.N. Burris, M. Mazarei, J.L. Bennetzen, W.A. Parrott, and C.N. Stewart Jr. 2011. Switchgrass (*Panicum virgatum* L.) ubiquitin gene (*PvUbi1* and *PvUbi2*) promoters for use in plant transformation. BMC Biotechnology. 11:74.
- Kretzer, A.M., **King Z.R.**, and S. Bai. (2009) Bacterial communities associated with tuberculate ectomycorrhizae of *Rhizopogon* spp. Mycorrhiza. 19:277-282.

## PUBLISHED ABSTRACTS:

- King, Z.,** H. Harris, J. Buck, H.R. Boerma, Z. Li. 2014. Fine mapping *Rpp6*, a valuable soybean rust resistance gene for the southeastern USA. 15<sup>th</sup> Biennial Conference on the Molecular and Cellular Biology of the Soybean. August 4, 2014. Minneapolis, Minnesota.
- King, Z.,** Z. Li, and H.R. Boerma. 2012. Efficient DNA extractions of soybean-seed chips for high-throughput and large scale SNP genotyping. 14<sup>th</sup> Biennial Conference on the Molecular and Cellular Biology of the Soybean. August 13, 2012. Des Moines, Iowa.
- King, Z.,** P. LaFayette, D. Mann, C.N. Stewart, and W. Parrott. 2010. Construction and validation of the novel panic vector set by stable and transient expression using *In Vitro* Cultures of switchgrass (*Panicum virgatum* L.) and Rice (*Oryza japonica* L.). *In Vitro Cellular & Developmental Biology-Animal*. DOI:10.1007/s11626-010-9339-6.
- Stewart, C.N., L. Abercrombie, H. Baxter, J. Burris, F. Chen, R. Dixon, R. Equi, M. Halter, H. Hisano, S. Hisano, **Z. King**, P. Lafayette, D. Mann, M. Mazarei, R. Nandakumer, R. Nelson, W. Parrott, C. Poovaiah, H. Ramanna, M. Rudis, Z. Wang, J. Zale, J. Hawkins, R. Percifield, and J. Bennetzen. 2009. Switchgrass (*Panicum virgatum* L.) transformation for altered cell wall biosynthesis in the DOE BioEnergy Science Center. *In Vitro Cellular & Developmental Biology-Animal*. DOI:10.1007/s11626-009-9203-8.

## GRANTS AND AWARDS:

**United Soybean Board PhD Fellowship:** Mapping Novel Resistance Genes to the Fungal Pathogen, Soybean Rust, **Total award: \$100,000.00**, Start date: July 2012, End date: July 2015.

**University of Georgia Graduate School Innovative and Interdisciplinary Research Grant:** High-Throughput SNP Genotyping of Soybean Using Seed Chips, **Total award: \$1,000.00**, Start date: July 2012, End date: August 2012.

## PATENT APPLICATION:

Provided critical data for proof of the patent “pANIC, a Complete Plant Transformation Vector Set for Monocots University of Tennessee, Ref PD9014, September 2008.”

## PROFESSIONAL SOCIETIES:

Blue Key National Honor Society: University of Georgia Chapter	<b>April 2014 – Present</b>
Honorary Member of the American Society of Agronomy	<b>June 2012 – Present</b>
Honorary Member of the Society for <i>In Vitro</i> Biology	<b>June 2011 – June 2012</b>

## PEER REVIEWER FOR SCIENTIFIC JOURNALS:

Reviewed one manuscript for <i>In Vitro</i> Cellular and Developmental Biology - Plant	<b>2014</b>
Reviewed three manuscripts for Molecular Breeding	<b>2012 – 2014</b>
Reviewed one manuscript for Plant Genetic Resources	<b>2013</b>

## PROFESSIONAL EXPERIENCE:

<b>Soybean Breeding CO-OP at Monsanto Co.</b>	<b>June 2013 – December 2013</b>
<b>Monsanto Company</b> , Mount Olive NC	
<b>Advisor: Jesse Gilsinger, Ph.D.</b>	

- Responsible for two independent projects: Insect resistance and maturity in soybean
- Laid out field plots, took phenotypic data/scores, analyzed data and presented results to Monsanto Co.
- Worked assisting in routine soybean breeding duties and assisted other team members
- Directed and trained individuals to help with the needs of the insect resistance project
- Sprayed herbicides and aided in both planting, harvesting, threshing, and seed packaging duties
- Evaluated the effectiveness of commercial herbicides and worked with regulated traits
- Took notes on flower color, lodging, progeny-row selection, pubescence color, and plant height
- Learned the basics of the proprietary molecular marker database and pedigree software of Monsanto
- Learned ISO standards, received driver safety training, and routine safety practices for equipment

**Doctoral Student at the Institute of Plant Breeding, Genetics and Genomics** **May 2011 – Present**

**The University of Georgia, Athens GA**

**Advisor: Roger Boerma, Ph.D.**

- Inoculating soybean plants with soybean rust (SBR) caused by *Phakopsora pachyrhizi* and phenotyping resistant and susceptible genotypes from crosses between disease resistant and susceptible parents
- Performing DNA extractions of resistant and susceptible bulks for the GoldenGate or Infinium (Illumina®) SNP assays and analyzing genotypic data from the SNP markers to identify novel rust resistance loci
- Analyzing GoldenGate SNP data to recover higher percentages of elite parent genome in backcross populations
- Mapping resistance genes using KASPar SNPs (LGC Genomics) I designed to develop breeder friendly markers for marker-assisted selection
- Selecting disease resistance in the field
- Making crosses to pyramid resistance genes into elite cultivars

**Master Student at the Institute of Plant Breeding, Genetics and Genomics** **July 2008 – May 2011**

**The University of Georgia, Athens GA**

**Advisor: Wayne Parrott, Ph.D.**

- Developed *in vitro* regeneration and transformation procedures via particle bombardment and *A. tumefaciens*-mediated transformation of switchgrass (*Panicum virgatum* L.) and rice (*Oryza sativa* L. japonica)
- Performed comparisons of explant sources, media and culture conditions for transformation
- Developed a high-throughput screening method to identify transformants via fluorescence microscopy
- Managed multiple undergraduates and technicians, and taught plant transformation and molecular analyses
- Designed, constructed, sequenced and validated vectors
- Performed fluorometric and bioluminescence analyses to quantify gene expression from plant materials
- Composed monthly laboratory reports to the Department of Energy – BioEnergy Science Center (BESC)
- Created a Laboratory Information Management System for the lab within BESC
- Recorded and managed data logs of humidity and temperature fluctuations in plant growth rooms
- Handled hazardous waste and radiation responsibilities for the lab according to university guidelines

**Visiting Research Scientist of the Institute of Applied Microbiology** **February 2009 – June 2009**

**University of Natural Resources and Applied Sciences Vienna: Plant Biotechnology Unit, Austria**

**Advisor: Margit Laimer, Ph.D.**

- Established biotechnology tools for conservation and evaluations of *Jatropha curcas* L. germplasm
- Organized and maintained a tissue culture genebank from 100s of genotypes from different geographic locations
- Developed protocols for DNA extractions to facilitate EcoTILLING to discover SNPs
- Evaluated efficiencies of protein extraction methodologies for proteomics research

**Honors Thesis Researcher in Biotechnology** **August 2007 – May 2008**

**SUNY-ESF Department of Environmental and Forest Biology, Syracuse NY**

**Advisor: Annette Kretzer, Ph.D.**

- Used novel, bacterial specific primers to analyze 16S rDNA sequences to reveal the bacterial communities associated with *Rhizopogon vinicolor* tuberculate ectomycorrhizae
- Performed DNA extractions, and purifications from plants, fungi and bacteria
- Cultured, transformed, and performed plasmid preparations from competent *E. coli* cells
- Conducted PCR electrophoresis on a broad range of eubacterial 16S rDNA sequences
- Sequenced bacterial 16S rRNA genes for identification and analysis of bacterial genera and species
- Worked with bioinformatics software to analyze DNA sequences including BLAST, and TreeClimber

**Independent Undergraduate Researcher: *In vitro* Plant Biology** **January 2007 – May 2008**

**SUNY-ESF Department of Forestry, Syracuse NY**

**Advisor: Charles Maynard, Ph.D.**

- Development of tissue culture methods for effective micropropagation of several switchgrass varieties
- Investigated somatic embryogenesis as a tool for plant engineering
- Cultured *A. tumefaciens* for plant transformation

**Research Experience for Undergraduates: National Science Foundation**  
**Cornell University, Boyce Thompson Institute for Plant Research, Ithaca NY**  
**Advisor: Maria Harrison, Ph.D.**

**June 2007 – August 2007**

- Presented: “The Role of Gibberellic Acid Related Genes of *Medicago truncatula* L. and Their Involvement in the Arbuscular Mycorrhizal Symbiosis”
- Performed analyses on DNA and RNA samples including reverse transcriptase-PCR
- Conducted *M. truncatula* – *A. rhizogenes*-mediated transformations
- Maintained plant lines, potted seedlings, and performed molecular analyses on progeny
- Designed primers, completed BLAST analyses, and identified events using PCR
- Analyzed transgenic root cells using GUS staining, fungal staining, and fluorescence microscopy

**RECENT LEADERSHIP POSITIONS:**

**Agronomy Graduate Student Association President (2010-2011)**  
**The University of Georgia, Athens GA**  
**Advisor: Miguel Cabrera, Ph.D.**

**August 2009 – 2012**

- Contributing member since August 2008-2013
- Organizing monthly breakfast events to connect graduate students and faculty
- Leading welcoming dinners for prospective students to the Institute of Plant Breeding Genetics and Genomics
- Hosting a graduate student poster contest to bring together departments of crop and soil science
- Working with peers to create a yearly vegetable-plant sale to raise money, and promote agricultural awareness

**Plant Breeding Genetics and Genomics Journal Club**  
**The University of Georgia, Athens GA**

**August 2009 – Present**

- Contributing member since August 2009
- Participating in monthly paper discussions to discuss relevant literature
- Leading paper discussions and critically analyzing experimental designs and scientific data

**Bioethics Society Member and President**  
**SUNY-ESF Department of Forestry, Syracuse NY**  
**Advisors: William Powell, Ph.D. and Lawrence Smart, Ph.D.**

**January 2005 – May 2008**

- Contributed as a club member since January 2005
- Organized weekly discussions on the technological advances and controversies surrounding biotechnology
- Held paper discussions of primary literature relevant to biotechnology
- Participated as the biotechnology liaison to recruit incoming undergraduates
- Hosted campus debates on transgenics, and environmental issues related to biotechnology

## RECENT HONORS:

- **3<sup>rd</sup> Annual Plant and Soil Interdisciplinary Symposium:** 1<sup>st</sup> Place in the PhD. Competition **2014**
- **National Council of Commercial Plant Breeders Graduate Student Award** **2014**
- **Student Registration Award:** 15<sup>th</sup> Biennial Soybean Conference (Minneapolis, MN) **2014**
- **Blue Key National Honor Society:** University of Georgia Chapter **2014**
- **Plant Breeding Genetics and Genomics Graduate Student Travel Award** **2010 – 2015**
- **Plant Breeding Genetics and Genomics:** 2<sup>nd</sup> Place Poster Competition **2013**
- **UGA College of Agricultural and Environ. Science:** 2<sup>nd</sup> Place Ag Abroad Photo Contest **2012**
- **International Rice Research Institute:** Rice Research to Production Course **2011**
- **E. Broadus Browne Award:** 1<sup>st</sup> Place for Masters Research Project **2011**
- **University of Georgia Travel Assistance Program Award** **2011**
- **Bioenergy Systems Research Initiative Retreat:** 1<sup>st</sup> Place Student Research Poster **2010**
- **Crop and Soil Science Student Poster Competition:** 3<sup>rd</sup> Place Student Research Poster **2010**
- **BESC: Martin Keller Award for Excellence:** Outstanding Scientific Contribution **2010**
- **Society For *In Vitro* Biology Hope E. Hopps Award:** Recognition of a Quality Student **2010**
- **Society For *In Vitro* Biology Student Fellowship** **2010**
- **Marshall Plan Scholarship:** To study at BOKU University, Vienna Austria **2008**
- **SUNY-ESF Honors Program Medal:** Thesis Under the Guidance of Dr. Kretzer **2008**
- **SUNY-ESF *Summa Cum Laude* Graduation Honors** **2008**
- **SUNY-ESF Alumni Memorial Scholarship:** Freshman and Junior Class Award **2004, 2007**
- **Who's Who Among College Students** **2007**
- **Syracuse University Office of Residence Life:** Academic Excellence Award **2007**
- **SUNY-ESF President's High Honors List:** Top 5<sup>th</sup> Percentile in Academic Standings **2004 – 2008**
- **Rensselaer Polytechnic Institute Medal:** Science and Mathematical Achievement **2004**
- **League Club Scholarship:** Academic Achievement in Biology **2004**

## PROFESSIONAL DEVELOPMENT IN PLANT BREEDING AND BIOTECHNOLOGY:

- **Workshop “Marker-Assisted Plant Breeding”** held at the University of Minnesota, Saint Paul, hosted by Dr. Rex Bernardo and Dr. Lucia Gutierrez, **June 5–8, 2012**
- **Workshop “Using R/qtl for Linkage Mapping and QTL Analysis: Demonstration and Hands On”** held at the Soybean Breeder's Workshop, St. Louis, MI, hosted by Dr. James Specht, **February 27, 2012**
- **Workshop “Marker-Assisted Selection: QTLs to Breeder-Friendly Markers”** held at the University of Georgia, Athens, GA, hosted by Dr. Roger Boerma, **November 20, 2010**
- **Workshop “*Agrobacterium*-mediated transformation of switchgrass”** held at the Noble Foundation, Ardmore, OK, hosted by Dr. Zeng-Yu Wang and Dr. Hiroshi Hisano, **January 5-6, 2010**
- **BioEnergy Science Center Workshop “Identification, Curation and Analysis of candidate genes for the Transformation Pipeline”** held at the Dancing Bear Lodge, Townsend, TN, Hosted by Dr. Lee Gunter, Dr. Xiaohan Yang, Dr. Udaya Kalluri and Dr. Jerry Tuskan, **February 20, 2008**
- **Workshop “Plant Cell Wall”** held at Emerson Hall, Ithaca, NY, hosted by Dr. Joss Rose and Breeana Urbanowicz, **July 3, 2007**

## PROFESSIONAL CERTIFICATIONS:

- **Certified in First Aid and CPR,** University of Georgia, Athens, GA, **Valid May 10, 2013 to May 10, 2015**
- **Advanced Radiation Worker,** University of Georgia, Athens, GA, **April 12, 2010**
- **Greenhouse Training and Certification** held at the Boyce Thompson Institute Atrium, Ithaca, NY, **July 12, 2007**

## PRESENTATIONS WITH REFERENCE TO UNIVERSITY:

### University of Georgia

**Seminar: “Fine mapping *Rpp6*, a valuable soybean rust resistance gene for the southeastern USA”**

**Z. King: November 14, 2014**

Presentation Location: University of Georgia, Paul D. Coverdell Center for Biomedical and Health Sciences, Athens, GA

**Poster: “Fine mapping *Rpp6*, a valuable soybean rust resistance gene for the southeastern USA”**

**Z. King: August 5, 2014**

Presentation Location: Molecular and Cellular Biology of the Soybean 15th Biennial Conference, Minneapolis, MN

**Seminar: “Fighting rusty beans with green genes”**

**Z. King: February 6, 2014**

Presentation Location: Center for Applied Genetic Technologies, University of Georgia, Athens, GA 30602

**Seminar: “Mapping and deploying soybean rust (*Phakopsora pachyrhizi*) resistance (*Rpp*) genes”**

**Z. King: February 22, 2013**

United Soybean Board Annual Meeting. Crowne Plaza, New Orleans, LA 70130

**Poster: “Efficient DNA Extractions of Soybean-Seed Chips for High-Throughput and Large Scale SNP Genotyping”**

**Z. King: August 12-15, 2012<sup>1</sup>**

**Z. King: February 7, 2014<sup>2</sup>**

Presentation Location: West Des Moines, Sheraton West Des Moines, IA 50266<sup>1</sup>

Presentation Location: Georgia/Florida Soybean/Small Grain Expo, Perry, GA<sup>2</sup>

**Seminar: “Soybean seed chipping, high-throughput genotyping, and application for mapping rust resistance”**

**Z. King: August 15, 2012**

Presentation Location: Monsanto Company, 3402 SE Convenience Blvd, Ankeny, IA 50021

**Thesis Defense Seminar: “Riddles in the dark: The development of genetic engineering procedures for elite genotypes of switchgrass”**

**Z. King: March 30, 2011**

Presentation Location: Center for Applied Genetic Technologies, University of Georgia, Athens, GA 30602

**Seminar: “Somewhere over the rainbow: The trait that saved papaya”**

**Z. King: April 28, 2011**

Presentation Location: Center for Applied Genetic Technologies, University of Georgia, Athens, GA 30602

**Poster: “Biolistic transformation of elite genotypes of switchgrass”**

**Z. King, P. LaFayette, P. Wu, K. Chiong, A. Lang, B. Artelt and W. Parrott: November 15, 2010 and February 20, 2011**

First Presentation Location: Georgia Center for Continuing Education, Athens, GA 30602

Second Presentation Location: Spitalgasse 2, 1090 Vienna, Austria, Altes AKH

**Poster: “Construction and validation of the novel pANIC vector set by stable and transient expression using *in vitro* cultures of switchgrass (*Panicum virgatum* L.) and rice (*Oryza japonica* L.)”**

**Z. King<sup>1</sup>, P. LaFayette<sup>1</sup>, D. Mann<sup>2</sup>, C. Neal Stewart, Jr.<sup>2</sup> and W. Parrott<sup>1</sup>: June 7, 2010 and June 21, 2010**

<sup>1</sup>Center for Applied Genetics and Technology, University of Georgia, Athens, GA 30602; <sup>2</sup>Department of Plant Sciences, University of Tennessee, Knoxville, TN 37996

First Presentation Location: St. Louis, MO 63102

Second Presentation Location: Crowne Plaza Hotel and Expo Center in Asheville, NC 28806

**Seminar: “Fluorescent Proteins: Shining Light on Transgenic Organisms”**

**Z. King: March 11, 2010**

Presentation Location: Center for Applied Genetic Technologies, University of Georgia, Athens, GA 30602

**Poster: “Construction and validation of the novel pANIC vector set by stable and transient expression using *in vitro* cultures of switchgrass (*Panicum virgatum* L.) and rice (*Oryza japonica* L.)”**

**Z. King<sup>1</sup>, P. LaFayette<sup>1</sup>, D. Mann<sup>2</sup>, C. Neal Stewart, Jr.<sup>2</sup> and W. Parrott<sup>1</sup>: October 22, 2009**

<sup>1</sup>Center for Applied Genetics and Technology, University of Georgia, Athens, GA 30602; <sup>2</sup>Department of Plant Sciences, University of Tennessee, Knoxville, TN 37996

Presentation Location: Château Élan Inn, Braselton, GA 30517

**Poster: “Efficient *in vitro* Regeneration of Switchgrass (*Panicum virgatum* L.) Somatic Embryos”**

**Z. King, P. Wu, and W. Parrott: December 1-3, 2008**

**Department of Crop and Soil Science, University of Georgia, Athens, GA**

Presentation Location: BioEnergy Science Center 2<sup>nd</sup> Annual Retreat, Chattanooga TN 37402

## University of Natural Resources and Applied Sciences Vienna: Plant Biotechnology Unit

**Seminar: “Growing green energy: *Jatropha curcas* L.”**

**Z. King, M. Laimer, G. Marzban, and F. Maghuly: June 22, 2009**

**Plant Biotechnology Unit, Institute of Applied Microbiology, Department of Biotechnology VIBT BOKU**

Presentation Location: Muthgasse 18, 1190 Vienna, Austria

## State University of New York College of Environmental Science and Forestry Presentations

**Poster: “Bacterial Communities Associated with *Rhizopogon vinicolor* Tuberculate Ectomycorrhizae”**

**Z. King and A. Kretzer: April 16, 2008**

**Department of Environmental and Forest Biology, State University of New York College of Environmental Science and Forestry**

Presentation Location: SUNY-ESF, Nifkin Lounge, Syracuse, NY 13210

**Poster: “*MtDELLA* a new gene involved in development of the AM symbiosis”**

**Z. King<sup>1</sup>, J. Levy<sup>1</sup>, J. Hong<sup>1</sup>, J. Jung<sup>1</sup>, C. Starker<sup>2</sup>, S. Gantt<sup>2</sup> and M. Harrison<sup>1</sup>: April 16, 2008**

**<sup>1</sup>Boyce Thompson Institute for Plant Research, Cornell University, Ithaca, NY 14853, USA; <sup>2</sup>Department of Plant Biology, University of Minnesota, St Paul, MN 55108, USA**

Presentation Location: SUNY-ESF, Nifkin Lounge, Syracuse, NY 13210

## Boyce Thompson Institute for Plant Research Presentation

**Seminar: “The Role of Gibberellic Acid Related Genes of *Medicago truncatula* L. and Their Involvement in the Arbuscular Mycorrhizal Symbiosis”**

**Z. King, J. Levy, J. Hong, J. Jung and M. Harrison: August 9, 2007**

Presentation Location: Cornell University, Boyce Thompson Institute for Plant Research, Ithaca NY

## COMPUTER PROFICIENCY:

- **JoinMap 4.1:** QTL Mapping software to create linkage maps and map soybean rust QTL
- **R/QTL Software Package:** QTL Mapping and Association Mapping Experience with R
- **SAS:** SAS Institute Inc. Data Analysis of ANOVA and Split-Plot Designs
- **GeneMapper:** Genotyping Polymorphism Results Obtained from Simple Sequence Repeat Markers
- **Microsoft Word:** Writing Scientific Reports, Manuscripts and Standard Operating Procedures
- **Microsoft Excel:** Spreadsheet Design, Model Development, and Statistical Analyses
- **Microsoft PowerPoint:** Constructing and Presenting Scientific Reports for Seminars or Lab Meetings
- **Microsoft Outlook:** Communicating to Colleagues and Organizing Work Schedules/Meetings
- **JMP® 8.0.2:** A Robust SAS® Analytics Program with Enhanced Visual Graphics
- **Redasoft Visual Cloning 3.0:** Creating, Annotating, and Presenting Vector Maps
- **NanoDrop®:** Quantifying Nucleic Acids
- **Sequencher™:** Annotating and Analyzing DNA Sequences
- **Geneious Pro 5.0.3:** Designing Gateway Compatible Vectors, Locating SNPs, and Managing Vector Libraries
- **Mini-Tab Software Package:** Statistical Analyses of Data and Constructing Figures
- **National Center for Biotechnology Information:** Proficient in Primer Design, BLAST Searches, and in using Comparative Genomics Tools
- **TreeClimber Software:** Aligning and Analyzing DNA Sequences
- **Terminal:** Bioinformatic Analyses and Writing Command Lines to Execute Programs
- **Kompozer HTML Editor:** Creating and Curating Websites
- **MrBayes Software:** Performing Bayesian Estimation of Phylogeny
- **Biology Workbench 3.2:** Protein and Nucleic Acid Sequence Analyses

## PROFESSIONAL AFFILIATIONS:

- Honorary Member of The American Society of Agronomy **July 2012 – Present**
- Honorary Member of the Society For *In Vitro* Biology **February 2010 – 2011**

## TEACHING EXPERIENCE:

**Graduate Teaching Assistant for the Plant Breeding Practicum** **July 2011 and July 2012**  
**The University of Georgia, Athens GA**

**Advisor: Roger Boerma, Ph.D. and Zenglu Li, Ph.D.**

- Guest lectured a graduate class of approximately 10 students
- Organized and presented two seminars on soybean breeding and molecular markers
- Explained new breeding technologies and how they improve genetic gain
- Gave a hands on laboratory tour to the class on the molecular breeding equipment

**Graduate Student of the Institute of Plant Breeding, Genetics and Genomics** **July 2008 – May 2011**  
**The University of Georgia, Athens GA**

**Advisor: Wayne Parrott, Ph.D.**

- Training and supervising several research technicians and up to four undergraduate students
- Leading laboratory exercises to develop research skills for molecular techniques such as PCR, DNA extractions and quantifications, molecular cloning, and bacterial and plant cell culture
- Writing detailed protocols to maintain high standards of research for co-workers
- Teaching students to work independently and in teams to accomplish goals and document research progress

**Undergraduate Teaching Assistant in Zoology** **January 2006 – May 2006**  
**SUNY-ESF Department of Environmental and Forest Biology, Syracuse NY**

**Advisor: Stephen Teale, Ph.D.**

- Advised an undergraduate laboratory section of over 20 students
- Organized and inventoried the zoology specimen libraries
- Performed detailed animal dissections to teach students hands on animal physiology and anatomy
- Proctored quizzes and laboratory exams

**Peer Tutor in Zoology** **January 2006 – May 2006**  
**SUNY-ESF Department of Environmental and Forest Biology, Syracuse NY**

**Advisor: Stephen Teale, Ph.D.**

- Tutored groups of up to 30 students
- Communicated effectively, and clearly to meet students' needs
- Prepared students for laboratory and lecture examinations
- Led weekly lecture reviews to prepare students for quizzes and tests using PowerPoint and open discussion

## RECENT COMMUNITY SERVICE AND ACTIVITIES IN GEORGIA:

- Vegetable-plant sale to raise money for graduate student activities, and promote agriculture **2008 – Present**
- Dirty Spokes 7.5/2.8 Mile Trail Running Race **2014**
- Tri To Beat Cancer Triathlon – Raising money for the American Cancer Society **2014**
- Taste of Athens 10 K **2014**
- Athens Chic-fil-A Half Marathon **2014**
- Athens Christian School AG Day – Educated Students about Soybean Farming and Genetics **2013**
- Independently Raised Over \$1,100 for the American Society in Memory of Bill King **2013**



## REFERENCES:

**Dr. H. Roger Boerma:** Major Professor (Emeritus)  
Executive Director of the Georgia Seed Development Commission  
2420 S. Milledge Ave.  
Athens, GA 30605  
(706) 552-4525      roger.boerma@gsdc.com

**Dr. Zenglu Li:** Professor  
Department of Plant Breeding Genetics and Genomics, University of Georgia  
101 Riverbend Rd. Center for Applied Genetic Technology  
Athens, GA 30602  
(706) 542-9805      zli@uga.edu

**Dr. Jesse Gilsinger:** Soybean Breeder and Monsanto CO-OP Supervisor  
Mt. Olive Soybean Breeding Station  
Mt. Olive, NC 28365  
(919) 609-6527      jesse.j.gilsinger@monsanto.com

**Dr. Wayne Parrott:** Professor  
Department of Plant Breeding Genetics and Genomics, University of Georgia  
101 Riverbend Rd. Center for Applied Genetic Technology  
Athens, GA 30602  
(706) 542-0928      wparrott@uga.edu

**Dr. C. Neal Stewart Jr.:** Professor  
Department of Plant Sciences, University of Tennessee  
2431 Joe Johnson Drive  
Knoxville, TN 37996  
(865) 974-7324      nealstewart@utk.edu

**Dr. Margit Laimer da Camara Machado:** Professor  
Institute of Applied Microbiology, University of Natural Resources and Applied Life Sciences Vienna  
Muthgasse 18  
1190 Vienna, Austria  
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