

Stephanie P. Klein

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Education

Ph.D. Plant Biology, 2020

The Pennsylvania State University
Advisor: Prof. Jonathan Lynch

Dissertation: "Functional implications and association mapping of root hydraulic traits for improved drought tolerance in maize (*Zea mays* L.)"

B.S. Integrative Biology, 2013

University of Illinois at Urbana-Champaign

Research Experience

Graduate Research Assistant

Aug 2014 – Present

The Pennsylvania State University

Advisor: Prof. Jonathan Lynch

- Studying the genetic mechanisms and physiological responses of contrasting root anatomical phenotypes to drought conditions in greenhouse and field settings
- Coordinated the maize field projects of a multi-national team of researchers at two research facilities (Arizona and Pennsylvania)
- Supervised 3 undergraduate student researchers

Research Associate

May 2013 – May 2014

Chromatin, Inc.

Objective(s): Tissue culture and molecular biology (DNA isolation, plasmid DNA assembly and sequencing, PCR, gel electrophoresis) for improvement of sorghum as a bioenergy crop.

Undergraduate Research Assistant

May 2011 – May 2013

Carl R. Woese Institute for Genomic Biology – Genomic Ecology of Global Change (UIUC)

Advisor: Prof. Andrew Leakey

Objective(s): Participated in many projects related to physiological and metabolic responses to elevated [CO₂] and drought in field-grown soybean at the SoyFACE facility. Managed and analyzed a minirhizotron image library of over 50,000 images.

Undergraduate Research Assistant

Sept 2010 – May 2011

Illinois Natural History Survey

Objective(s): Evaluate Riparian stream samples for macroinvertebrate quantity and diversity

Teaching Experience

HORT402 *Plant Nutrition*

Teaching Assistant (2015, 2017, 2018, 2019, 2020)

Head Teaching Assistant (2016)
Guest Lecturer (2016, 2017)

Awards and Honors

2020 Huck Graduate Student Travel Grant
2019 National Science Foundation Travel Award, Division of Integrative Organismal Systems (grant #IOS-1912135)
2019 American Society of Plant Biologists Annual Meeting Travel Grant
2017 Pennsylvania State University College of Agricultural Sciences Travel Award
2016 Huck Graduate Research Innovation Award

Grants

USDA-AFRI, #2017-67013-26192, “Optimizing root metaxylem phenotypes to improve drought tolerance in maize”, 3/15/2017 – 3/14/2020; \$470,000

- Wrote with advisor, Prof. Jonathan Lynch, who was listed as PI

Publications

1. Gray SB, O Dermody, **SP Klein**, AM Locke, JM McGrath, RE Paul, DM Rosenthal, UM Ruiz-Vera, MH Siebers, R Strellner, EA Ainsworth, CJ Bernacchi, SP Long, DR Ort, ADB Leakey (2016) Intensifying drought eliminates the expected benefits of elevated carbon dioxide in soybean. *Nature Plants* 2. DOI: 10.1038/nplants.2016.132.
2. Orman-Ligeza B, EC Morris, B Parizot, T Lavigne, A Babé, A Ligeza, **S Klein**, C Sturrock, W Xuan, O Novák, K Ljung, MA Fernandez, PL Rodriguez, IC Dodd, I De Smet, F Chaumont, H Batoko, C Périlleux, JP Lynch, MJ Bennett, T Beeckman, X Draye (2018) The xerobranching response represses lateral root formation when roots are not in contact with water. *Current Biology* 28 (19): 3165-3173. DOI: 10.1016/j.cub.2018.07.074
3. Schneider HM, **SP Klein**, MT Hanlon, EA Nord, S Kaeppler, KM Brown, A Warry, R Bhosale, J Lynch (2020) Genetic control of root architectural plasticity in maize. *Journal of Experimental Botany*. DOI: 10.1093/jxb/eraa084
4. Schneider HM, **S Klein**, MT Hanlon, S Kaeppler, KM Brown, JP Lynch (2020) Genetic control of root anatomical plasticity in maize. *The Plant Genome*. DOI: 10.1002/tpg2.20003
5. **Klein SP**, HM Schneider, A Perkins, K Brown, J Lynch. Multiple integrated root phenotypes are associated with improved drought tolerance. (2020) *Plant Physiology*. DOI: 10.1104/pp.20.00211
6. **Klein SP**, JE Reeger, S Kaeppler, K Brown, J Lynch. Shared genetic architecture underlying root metaxylem phenotypes under drought stress in cereals. (Submitted) *Plant Physiology*.

Workshops and Meetings Organized

2020 Gordon Research Seminar on Salt and Water Stress in Plants, Chair
*Postponed to 2022

2019 American Society of Plant Biologists Annual Meeting, “Careers Beyond Academia”, organizing sub-committee of Membership Committee

Oral Presentations

- SP Klein** (2020) Integrated root phenotypes associated with enhanced drought tolerance in maize. *Interdrought 2020*, Mexico City, Mexico. *cancelled due to COVID-19
- SP Klein** (2020) Integrated root phenotypes associated with improved drought tolerance in maize. *Penn State Plant Biology Seminar Series*, Penn State University, University Park, PA, USA.
- SP Klein** (2020) Integrated root phenotypes associated with improved drought tolerance in maize. *Iowa State University, Ames, IA, USA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2019) Root metaxylem as a novel target for improved drought tolerance in maize. *Maize Genetics Meeting, St. Louis, MO, USA*.
- SP Dineshkumar, P Hines, **SP Klein**, B Montgomery, M Smith, V Markham, L Wayne (2018) ASPB Minority Affairs Committee and Women in Plant Biology Committee Workshop: “Strategies for developing leadership skills.” *ASPB Plant Biology 2018, Montreal, QC, CA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2018) Do smaller root metaxylem vessels improve drought tolerance in maize? *Gordon Research Seminar: Salt and Water Stress in Plants, Waterville Valley, NH, USA*.
- SP Klein**, K Brown, J Lynch (2017) Identifying root phenes for improved maize performance in nitrogen- and water-limited environments. *Joint International Sweet Corn Development Association and the Corn Breeding Research Annual Meeting, Chicago, IL, USA*.

Posters

- SP Klein**, K Brown, S Kaeppler, J Lynch (2019) Root metaxylem as a novel target for improved drought tolerance in maize. *ASPB Plant Biology 2019, San Jose, CA, USA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2019) Root metaxylem as a novel target for improved drought tolerance in maize. *Plant Vascular Biology, Monterey, CA, USA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2018) Smaller root metaxylem vessels for improved drought tolerance in maize. *ASSA and CSSA Annual Meeting, Baltimore, MD, USA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2018) Smaller root metaxylem vessels for improved drought tolerance in maize. *ASPB Plant Biology 2018, Montreal, QC, CA*.
- SP Klein**, K Brown, S Kaeppler, J Lynch (2018) Smaller root metaxylem vessels for improved drought tolerance in maize. *Gordon Research Conference: Salt and Water Stress in Plants, Waterville Valley, NH, USA*.
- SP Klein**, S Kaeppler, K Brown, J Lynch (2017) Identifying genes underlying maize root metaxylem plasticity in response to drought. *Xylem International Meeting, Bordeaux, France*.
- SP Klein**, S Kaeppler, K Brown, J Lynch (2017) Root metaxylem: Discovering new phenes for drought tolerance in maize. *Interdisciplinary Plant Group Symposium 2017, Columbia, Missouri, USA*.
- SP Klein**, S Kaeppler, K Brown, J Lynch (2016) Root metaxylem: Discovering new phenes for drought tolerance in maize. *ASPB Plant Biology 2016, Austin, Texas, USA*.
- SP Klein**, R Paul, SB Gray, ADB Leakey (2013) Minirhizotron imaging shows strong interaction effects of drought and elevated CO₂ on soybean nodulation in a Free-Air CO₂ Enrichment field experiment. *ASPB Plant Biology 2013, Providence, Rhode Island, USA*.

Professional Service

Director of Culture <i>American Society of Plant Biologists – Early Career Section</i>	Oct 2020 – Present
Advisory Council Member <i>American Society of Plant Biologists – Environmental Ecology and Plant Physiology Section</i>	Oct 2018 – Present
ASPB Environmental Ecology and Plant Physiology Representative <i>American Society of Plant Biologists – Early Career Section</i>	Feb 2020 – Oct 2020
ASPB Ambassador Alliance Outgoing Chair <i>American Society of Plant Biologists – Ambassador Program</i>	Oct 2019 – Oct 2020
Graduate Student Ambassador <i>American Society of Plant Biologists</i>	Aug 2015 – Oct 2020
ASPB Ambassador Alliance Chair <i>American Society of Plant Biologists – Ambassador Program</i>	Nov 2018 – Oct 2019
Graduate Student Representative <i>American Society of Plant Biologists – Membership Committee</i>	Sept 2015 – Sept 2019

University Service

Scientist Mentor <i>Planting Science</i>	Feb 2017 – Present
Committee Member, Plant Biology Representative <i>Huck Graduate Student Advisory Committee</i>	Sept 2015 – Sept 2017
Student-invited speaker liaison <i>Penn State Plant Biology Program</i>	Sept 2015 – Sept 2017
Webmaster <i>Roots Lab</i>	July 2015 – Jan 2017

Professional Memberships

American Society of Plant Biologists
 American Society of Agronomy
 Crop Science Society of America
 Soil Science Society of America
 Maize Genetics Cooperation