

## **Nathalia Graf-Grachet, Ph.D.**

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### **EDUCATION**

#### **PhD, Plant Pathology, August 2019**

Oklahoma State University, Stillwater, OK

Host-pathogen interactions in the spring dead spot of bermudagrass pathosystem

#### **MS, Entomology and Plant Pathology, May 2015**

Oklahoma State University, Stillwater, OK

Effect of foliar fungicide on chlorophyll content, disease control, and grain yield of winter wheat varieties

#### **BS, Agricultural Engineering, May 2012**

Federal University of Sao Carlos, Araras, Sao Paulo, Brazil

Senior thesis: Reaction of chili lines to the juvenile phase of root-knot nematode

### **ACHIEVEMENTS, HONORS & AWARDS**

2018: Helmsley Fellowship, Cold Spring Harbor Laboratory

2018: William Family Engineer Distinguished Graduate Fellowship

2018: 1<sup>st</sup> Place Student Poster Competition Award, Third Soil Biology Symposium, Oklahoma State University

2017: Helmsley Fellowship, Cold Spring Harbor Laboratory

2017: William Family Engineer Distinguished Graduate Fellowship, Oklahoma State University

2017: Otto S. Cox Graduate Fellowship for Genetics Research, Oklahoma State University

2017: 1<sup>st</sup> Place Student Poster Competition Award, Soil Biology Symposium, Oklahoma State University

2015: Graduate College Top Tier Fellowship, Oklahoma State University

2015: 33<sup>rd</sup> Phoenix Award for Outstanding Masters Student, Oklahoma State University

2008: São Paulo Research Foundation Fellowship for undergraduate research 2008 - 2009

## **PROFESSIONAL EXPERIENCE**

### **Postdoctoral Research Associate I, October 2019 - present**

University of Arizona, Tucson, AZ

Dr. Malak Tfaily's ecosystem genomics laboratory

- Responsible for developing, and deploying data analysis pipelines for untargeted metabolomics, genomics/transcriptomics, and multi-omics data integration that resulted in 4 first-author publications in preparation
- Actively assisted in writing grant proposals such as DOE-BER proposal, which was awarded to Principal Investigator (Dr. Malak Tfaily)
- Collaborated on a variety of environmental metabolomics projects ranging from desert, peatlands, agricultural systems resulting in 1 paper submitted, 2 accepted or published
- Initiated a collaborative agricultural metabolomics research, which resulted in 1 grant-proposal in preparation
- Mentored undergraduate and graduate students in laboratory safety, organization, record keeping, and to develop research projects in the laboratory

### **Graduate Research Assistant, January 2013 - August 2019**

Oklahoma State University, Stillwater, OK

- Published 8 scientific (peer-reviewed and extension-type) publications
- Presented results at national and international conferences
- Conducted field and greenhouse research on the effect of fungicides on chlorophyll content, disease control, and grain yield of winter wheat cultivars
- Conducted laboratory research and computational analyses to study plant-pathogen interaction in the bermudagrass-spring dead spot pathosystem
- Trained international interns in laboratory safety, organization and procedures
- Mentored international interns to develop research projects in the laboratory

### **Visiting Research Scholar, March - October 2012**

Oklahoma State University, Stillwater, OK

- Responsible for fungicide hormesis project and resulted in 1 published in peer-review article
- Trained international interns in laboratory procedures
- Assisted other graduate students in their research projects

## **LEADERSHIP**

### **XSEDE Student Campus Champion, August 2018 - August 2019**

- XSEDE (The Extreme Science and Engineering Discovery Environment).
- One of two students of Oklahoma State University selected to participate.
- Guided users of different research backgrounds to accomplish their research goals using high performance computer.

### **Board Member, Mobile Meals, April 2017 - September 2019**

- Mobile Meals is a non-profit organization in Stillwater, Oklahoma, USA.
- Worked with the Director in outreach initiatives.

### **President, August 2016 - May 2017**

#### Entomology and Plant Pathology Graduate Student Association

- Obtained \$2,000 in grants campus-wide and through fundraising.
- Prioritized and delegated tasks and fundraising events to officers.
- Invited speakers to talk about career development.
- Initiated a graduate student seminar exchange program with the departments of Entomology and Plant Pathology of University of Arkansas.

### **Treasurer, August 2014 - May 2016**

#### Entomology and Plant Pathology Graduate Student Association

- Created record of deposits and disbursement vouchers.
- Worked alongside the President to organize journal-clubs, purchased food and beverages.
- Organized practice sessions with cash awards for graduate students from our department who participated in the campus-wide 3-Minute Thesis Competition.

## SCIENTIFIC PUBLICATIONS

### PEER-REVIEWED

1. Buzzard, V., Gil-Loizada, J., **Graf Grachet, N.**, Talkington, H., Youngerman, C., Tfaily, M. M., Meredith, L. K. Green infrastructure influences soil health: biological divergence one year after installation. (*Submitted*)
2. Tfaily, M. M., Fudyma, J., Toyoda, J., Chu, R., Weitz, K., Heyman, K., Eder, E., Hoyt, D., Gieschen, H., **Graf Grachet, N.**, Wilson, R. Sequential abiotic-biotic processes drive organic carbon transformation in peat bogs. (*Accepted in Journal of Geophysical Research*)
3. Fudyma, J., Chu, R. K., **Graf Grachet, N.**, Stegen, J., Tfaily, M. M. 2020. Coupled Biotic-Abiotic Processes Control Biogeochemical Cycling of Dissolved Organic Matter in The Columbia River Hyporheic Zone. *Front. Water* doi: 10.3389/frwa.2020.574692
4. Pradhan-Shrestha, S., Miller, L., Marcillo, V., **Graf Grachet, N.**, Molineros, J. E., Walker, N. R., Melouk, H., Garzon, C. D. 2019. Hormetic effects of thiophanate-methyl in multiple isolates of *Sclerotinia homeocarpa*. *Plant Disease* 103(1):89-94.
5. **Graf-Grachet, N.**, Rebek, E., Royer, T., and Walker, N. 2017. Spatial and temporal distribution of *Phyllophaga* spp. infesting bermudagrass stands in Oklahoma. *International Turfgrass Society Research Journal*. 13(1):489-496.
6. **Graf-Grachet, N.** and Walker, N. 2016. First report of brown ring patch caused by *Waitea circinata* on perennial ryegrass (*Lolium perenne*) in Oklahoma. *Plant Disease* 100:855.
7. Urashima, A.S., and **Grachet, N.G.** 2012. Detection method for *Leifsonia xyli* subsp. *xyli* and effect of thermotherapy on bud germination in sugarcane varieties. *Tropical Plant Pathology*. 37(1):57-64.

### NON-PEER-REVIEWED

1. Hunger, R., **Graf-Grachet, N.**, Olson, R., Walker, R. and Edwards, J. 2016. Use of foliar fungicides to manage powdery mildew and leaf rust on winter wheat in Oklahoma, 2015. *Plant Disease Management Rep.* 10:CF038. Online Publication.
2. Hunger, R., Cruppe, G., Edwards, J. and **Graf-Grachet, N.** 2016. Evaluation of seed treatments for effect on multiple agronomic components of hard red winter wheat in Oklahoma, 2015. *Plant Disease Management Rep.* 10:CF035. Online Publication.
3. Hunger, R., **Graf-Grachet, N.**, Olson, R., Walker, R. and Edwards, J. 2015. Effect of foliar fungicides on winter wheat in the absence of disease in Oklahoma, 2014. *Plant Disease Management Rep.* 9:CF019. Online Publication.

4. **Graf-Grachet, N.**, Hunger, R., Olson, R., Walker, R., and Edwards, J. 2014. Early season fungicide application to manage powdery mildew on winter wheat in Oklahoma, 2013. Plant Disease Management Rep. 8:CF033. Online Publication.
5. Hunger, R., **Graf-Grachet, N.**, Olson, B., Walker, R. and Edwards, J. 2014. Management of powdery mildew and leaf spot diseases on winter wheat in Oklahoma, 2013. Plant Disease Management Rep. 8:CF032. Online Publication.

## **PRESENTATIONS**

1. **Graf-Grachet, N.**, Rodshagen, T., Jones, A., Reichman, H., Tfaily, M. Temperature controls organic matter bioavailability, greenhouse gas production, and microbial community in a peat bog. 2020 ASA-CSSA-SSSA International Annual Meeting (Oral, Virtual).
2. **Graf-Grachet, N.**, Hunger, R.M., Payton, M.E. and Edwards, J. Variation in the reaction of hard red winter wheat cultivars to common root rot and spot blotch. 2014 American Phytopathological Society Annual Meeting (Oral).
3. **Graf-Grachet, N.**, Hunger, R.M., Payton, M.E. and Edwards, J. Variation in the reaction of hard red winter wheat cultivars to common root rot and spot blotch. 2014 OSU Research Symposium Week (Oral).
4. **Grachet, N.G.** and Urashima, A.S. Effect of preservation period of sugarcane juice on diagnosis of ratoon stunting disease. 2009 Brazilian Phytopathological Society Annual Meeting in Rio de Janeiro, RJ, Brazil (Oral).

## **INVITED TALKS**

1. **Graf-Grachet, N.**, Rodshagen, T., Jones, A., Reichman, H., Tfaily, M. Temperature controls organic matter bioavailability, greenhouse gas production, and microbial community in a peat bog. 2020 Department of Entomology and Plant Pathology, Oklahoma State University (Departmental seminar).

## **TEACHING EXPERIENCE**

### **Plotting and Programming with Python, 12/07/2020**

Data Carpentry Workshop for Social Scientists, Texas State Digital Library, Remote

### **Plotting and Programming with Python, 02/16/2020**

Data Carpentry Workshop, University of Arizona, Tucson, AZ

### **Plotting and Programming with Python, 08/12/2019**

Software Carpentry Workshop, University of Central Oklahoma, Edmond, Oklahoma

### **Plotting and Programming with Python, 05/31/2019**

Software Carpentry Workshop, Oklahoma State University, Tulsa, Oklahoma

### **Plotting and Programming with Python, 01/11/2019, 03/19/2019, and 05/14/2019**

Software Carpentry Workshop, Oklahoma State University, Stillwater, Oklahoma

### **Introduction to Unix, 11/02/2018**

Software Carpentry Workshop, Oklahoma State University, Stillwater, Oklahoma

### **Data Organization Practices, 10/18/2018**

Data Carpentry Workshop, Oklahoma State University, Stillwater, Oklahoma, USA

### **Introduction to Python, 08/16/2018**

Python Workshop, Oklahoma State University, Stillwater, Oklahoma, USA

- Taught for 20+ researchers including graduate students and faculty

### **Introduction to Programming, 03/17/2018**

Department of Entomology & Plant Pathology, Oklahoma State University, Stillwater, Oklahoma, USA

- Initiated a collaboration with a bioinformatician on the organization of course material to transfer knowledge to fellow graduate students
- Taught for 20+ researchers including graduate students and faculty

### **Integrated Pest Management Summer Course, May - June 2015**

Oklahoma State University & Tecnológico de Monterrey Outreach Program, Stillwater, Oklahoma, USA

- Taught 10+ undergraduate students from Tecnológico de Monterrey
- Designed syllabus and course material (lectures, exams, homeworks and final paper)
- Applied and graded exams, homeworks, and final paper

## **RELEVANT TRAININGS**

### **FOSS: Foundation Open Science Skills, June 2019**

CyVerse, University of Arizona, Tucson, AZ

### **Plant Biosecurity in Theory and Practice, May 2019**

Biosecurity Research Institute, Kansas State University, Manhattan, KS

### **Advanced Sequencing Technologies & Applications, November 2018**

Cold Spring Harbor Laboratory Meetings & Courses, Cold Spring Harbor, NY

### **Programming for Biology, October 2017**

Cold Spring Harbor Laboratory Meetings & Courses, Cold Spring Harbor, NY

### **Mass Spectrometry and Proteomics, August 2016**

Department of Biochemistry and Molecular Biology, Oklahoma State University, Stillwater, OK

## **CERTIFICATIONS**

### **Certified Instructor for Data & Software Carpentry, August 2018 - present**

Data & Software Carpentry

### **Certified Pesticide Application Demonstrations and Research, 2014 - 2018**

Oklahoma Department of Agriculture, Food & Forestry

## **SOCIETY MEMBERSHIPS**

American Phytopathological Society since 2012

Honor Society Phi Kappa Phi since 2014

Genetics Society of America since 2016

International Turfgrass Society since 2016

Soil Science Society of America since 2020

American Geophysical Union since 2020

## **LANGUAGE ABILITIES**

Portuguese, native

English, fluent

Spanish, working proficiency

## **COMPUTER LANGUAGES AND SOFTWARE SKILLS**

### **Proficient**

Python, IDE: Jupyter notebook/lab

Linux/Bash shell and scripting

R/RStudio

Git/GitHub/GitLab

Markdown

Cloud computing/HPC

### **Basic**

Docker

Singularity

SQL

Frameworks: Hugo

## **BIOINFORMATICS SKILLS**

Experience with high-throughput sequencing technologies Illumina, PacBio, Oxford Nanopore, and 10X Genomics. Sequence alignment, genome assembly, genome visualization, differential gene expression analysis, and annotation.

Experience with proteomics and untargeted metabolomics of direct infusion, liquid chromatography, and tandem mass spectrometry.

Experience working with databases such as UniProt, GenBank/NCBI, EBI, KEGG, Pfam, CAZy, PHI-base, etc., for multi-omics data integration.

## **VOLUNTEER WORK**

**Data & Software Carpentry Workshop Helper and Instructor, 2018 - present**

High Performance Computing Center, Oklahoma State University, Stillwater, OK

**Driver and Member of the Board of Directors, Mobile Meals (non-profit org.), 2017 - 2019**

Stillwater, OK