

School of Plant Sciences - Graduate Student Selected Seminar Speaker Nominees

2017-2018 academic year

For nominating, please follow the format of last year (below). In detail, you can put the name of your nominees in **BOLD**, and write briefly about his/her research or publication.

You can nominate more than 1 person.

You can refer the last-year nominees and past invited speakers (at the last page) below.

This document is opened throughout the year. Please nominate whenever you want.

Dr. Randy C. Ploetz -University of Florida (Nominated by Lourena Arone)

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Institution: University of Florida - Center for Tropical Agriculture (UF-CTA)

Dr. Randy C. Ploetz is a Professor of Plant Pathology is research program is conducted on soil borne and foliar diseases of fruit, vegetable and ornamental crops. He has ongoing collaborations in several countries and has worked in 34 since 1990 (Australia, Austria, Bahamas, Benin, Bolivia, Brazil, Burundi, Canada, China, Colombia, Costa Rica, Ecuador, Egypt, France, Honduras, Indonesia, Israel, Jamaica, Malawi, Malaysia, Mexico, Nicaragua, Nigeria, Oman, Peru, Rwanda, South Africa, Spain, Swaziland, Taiwan, Thailand, Uganda, United Arab Emirates, and the United Kingdom).

Current research interest with major impact

Much of his work has been on banana diseases, especially *Fusarium* wilt. He introduced new banana germplasm to South Florida and evaluated its response to local vegetative compatibility groups (VCGs) of the pathogen, *Fusarium oxysporum* f. sp. cubense (Foc). He was the first to study global populations of Foc and with colleagues showed that Foc is polyphyletic; this was the first example of multiple evolutionary origins for a *Fusarium* wilt pathogen. In 1989, he discovered a new strain of Foc (tropical race 4, TR4), which now devastates production of the important Cavendish subgroup in the Eastern Hemisphere and threatens export trades in the Americas that rely on these cultivars. As it spreads, TR4 could cause dramatic changes in where and how bananas are produced for international trade. He can help us understand why bananas as we know them might go extinct.

Ploetz is a world authority on tropical fruit diseases, on which he has written more than 400 publications. He edited two books, *Fusarium Wilt of Banana* and *Compendium of Tropical Fruit Diseases*, for APS PRESS and another for CAB International, *Diseases of Tropical Fruit Crops*, which is now a standard reference.

Selected Publications:

1. Ploetz, R.C et al.... 2013. An inordinate fondness for *Fusarium*: Phylogenetic diversity of *Fusarium* cultivated by ambrosia beetles in the genus *Euwallacea* on avocado and other plant hosts. *Fungal Genetics and Biology* 56:147-157.

2. Ploetz, R.C. 2015. Management of Fusarium wilt of banana: A review with special reference to tropical race 4. Invited review for a special issue of Crop Protection. 73:7-15.
3. G. Fourie, E.T. Steenkamp, R.C. Ploetz, T.R. Gordon, and A. Viljoen. 2011. Biology and evolution of *Fusarium oxysporum*, with specific reference to the banana wilt pathogen. Infection, Genetics and Evolution 11:533–542.

Dr. Susan McCouch (Aaron White)

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Institution: Cornell University

Lab Website: <https://ricelab.plbr.cornell.edu>

Dr. McCouch is a fantastic example of a scientist that has produced quality research for decades. Her early work with rice genetics was very influential, and her lab at Cornell continues to publish at an extremely high rate.

Research Interests:

Her current work focuses on the identification and characterization of genes and quantitative trait loci (QTL) from low-yielding wild and exotic *Oryza* species that enhance the performance of modern rice cultivars. Her past research focuses on rice and includes publication of the first molecular map of the rice genome in 1988, early QTL studies on disease resistance, drought tolerance, maturity and yield, development of the essential repertoire of SSR markers widely used as a genomic resource in rice genetics and breeding, cloning of genes underlying critical traits for rice improvement and studies on the evolutionary history of rice in both Africa and Asia.

Selected Publications:

1. SD Tanksley, SR McCouch. 1997. Seed Banks and Molecular Maps: Unlocking Genetic Potential from the Wild. *Science* <http://science.sciencemag.org/content/277/5329/1063.full>
2. SR McCouch et al. 2016. Open access resources for genome-wide association mapping in rice. *Nature Communications* <https://www.nature.com/articles/ncomms10532>
3. J. Cobb, G DeClerck, A Greenberg, R Clark, SR McCouch. 2013. Next-generation phenotyping: requirements and strategies for enhancing our understanding of genotype–phenotype relationships and its relevance to crop improvement. *Theoretical and Applied Genetics*. <https://link.springer.com/article/10.1007/s00122-013-2066-0>

Dr. Sunshine Van Bael - Tulane University (Ashton Leo)

<http://vanbaellab.wp.tulane.edu/>

<https://stonecenter.tulane.edu/articles/detail/1104/Sunshine-A.-Van-Bael>

Professor

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Research:

Dr. Sunshine Van Bael's laboratory studies community ecology with emphases on symbioses and plant-animal interactions. Broadly, we are interested in how plants, animals and fungi become involved in symbioses with other organisms to feed themselves and defend themselves from enemies. We are involved in projects in Panama and in the southeastern US that include microbial ecology, chemical ecology, biodiversity conservation, coastal restoration and agroecology.

Keywords: Community ecology; vertebrate ecology; microbial ecology; plant-animal-fungal interactions; multi-trophic interactions; tropical agriculture; biodiversity

Papers:

1. Washburn, G. and Van Bael S.A. 2017. Fungal diversity in galls of baldcypress trees. *Fungal Ecology* 29: 85-89. (pdf)
2. Mighell, K. and Van Bael, S. A. 2016. Selective elimination of microfungi in leaf-cutting ant gardens. *Fungal Ecology*, 24:15-20. (pdf)
3. Hall, J.E., Moss, D., Stallard, R.,.... Van Bael, S..... et al. Managing Watersheds for Ecosystem Services in the Steepland Neotropics. 2015. - Available in English and Spanish (Please download from this site).
4. Tellez, Rojas and Van Bael. 2016. Red coloration in young tropical leaves associated with reduced fungal pathogen damage. *Biotropica*, 48: 150–153. doi: 10.1111/btp.12303 (pdf)

Dr. Ignazio Carbone - North Carolina State University (Ashton Leo)

<https://plantpath.cals.ncsu.edu/people/faculty/ignazio-carbone/>

Professor

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Research:

My research interests are in evolutionary biology, molecular population genetics and genomics. Research in my laboratory is interdisciplinary and combines sampling of genetic and phenotypic variation in natural fungal populations, in silico comparative analyses of fungal genomes, and the development of integrative evolutionary analysis tools. An important aspect of our work is developing new methodologies and tools to examine the influence of mutation, recombination, gene flow, selection and demography on the evolution of fungal genomes, populations and species. Our computational goal is to effectively manage and integrate the plethora of new approaches for making inferences on population processes from DNA sequence variation, bringing together simple summary-statistics, nonparametric methods and complex parameter-rich models. We have been developing new methodologies and tools for integrating genetic and phenotypic data within an evolutionary framework. Recently we released a flexible and scalable workbench tool that manages a series of population genetic programs.

A major focus is examining the evolution of fungal secondary metabolism, specifically the sterigmatocystin (ST), O-methylsterigmatocystin (OMST) and aflatoxin (AF) biosynthetic pathway in *Aspergillus*. The genes for ST, OMST, and AF are clustered and these compounds are synthesized as end products by numerous ascomycetes. Although all three metabolites (ST, OMST, and AF) are potent carcinogens in animals, the biological and evolutionary significance of these bioreactive compounds in fungi is unknown. We are combining inferences from macro- and micro-evolutionary analyses to understand the conservation of these metabolites among *Aspergillus* species and how diversity is generated and maintained within species over long periods of time. Recent work examines genetic variation in experimental populations and in field studies using biological control strains.

1. [Call, A., Sun, Y-X., Yu, Y., Pearman, P. B., Thomas, D. T., Trigiano, R., Carbone, I. and J. Xiang 2015.](#) Genetic structure and post-glacial expansion of *Cornus florida* L. (Cornaceae): Integrative evidence from phylogeography, population demographic history, and species distribution modeling. *Journal of Systematics and Evolution* DOI: 10.1111/jse.12171.
2. [Putman, A. I., Tredway, L. P. and I. Carbone. 2015.](#) Characterization and distribution of mating-type genes of the turfgrass pathogen *Sclerotinia homoeocarpa* on a global scale. *Fungal Genetics and Biology* 81: 25-40.
3. [Lassiter, E. S., Russ, C., Nusbaum, C., Zeng, Q., Saville, A., Olarte, R., Carbone, I., Hu, C-H, Thorne, J. L. and J. B. Ristaino. 2015.](#) Mitochondrial genome sequences and evolutionary relationships of the *Phytophthora* Ic clade species. *Current Genetics* DOI: 10.1007/s00294-015-0480-3.

Meyers, M., R. Heiniger, L. Boerema, I. Carbone. 2015. *The Use of Management Practices to Reduce Mycotoxin Contamination in Corn*. AG-807. Raleigh, NC: North Carolina Cooperative Extension Service. <http://content.ces.ncsu.edu/the-use-of-management-practices-to-reduce-mycotoxin-contamination-in-corn/>.

Dr. Kevin Folta (Nominated by Austin Frisbey)

Email: kfolta@ufl.edu

University of Florida

<http://hos.ufl.edu/kevinfolta/>

Research Interests:

- Functional genomics of small fruit crops
- Plant transformation
- Photomorphogenesis and flowering
- Genetic basis of flavors
- Science communication and outreach

From his website: "Plant productivity and product quality is an exquisite interplay between genetics and environment. We seek to understand both, and merge these areas to affect plant product quality, focusing mainly on small fruits. We utilize genomics-level gene discovery methods that integrate transcriptomics, analytical chemistry and genetics to hone predictions on candidate genes affecting fruit quality. Once identified, we can provide gold-standard functional validation using transgenic plants. When genes are functionally tied to traits, we then can search for genetic variability among existing genetic lines and help inform breeding decisions to produce more nutritious fruit with better flavors.

We're also interested in how light can modulate important plant traits like flavor, nutrition, shelf life and general quality. Our laboratory uses the newest technology in LED-based lighting to devise light "recipes" that can control key plant traits. Our goal is to adjust the flavors, nutrition and quality of plant-derived products using these inexpensive, non-chemical treatments."

Recent Publications:

Carvalho, S.D., Chatterjee, M., Coleman, L., Clancy, M.A., Folta, K.M. (2016) Analysis of *BLOCK OF CELL PROLIFERATION 1 (BOP1)* activity in strawberry and Arabidopsis. *Plant Science* (in press)

Mahoney, L.L., Sargent, D.J., Abebe-Akele, F., Wood, D.J., Ward, J.A., Bassil, N.V., Hancock, J.F., Folta, K.M., Davis, T.M. (2016) A high-density linkage map of the ancestral diploid strawberry, *Fragaria iinumae*, using SNP markers from the ISTRAW90 array and GBS. *Plant Genome* (in press).

Wu, J., Folta, K.M., Xie, Y., Jiang, W., Lu, J., Zhang, Y. (2016) Overexpression of *Muscadinia rotundifolia* CBF2 gene enhances biotic and abiotic stress tolerance in Arabidopsis. *Protoplasma*. (in press)

Sanchez-Sevila, J.F., Horvath, A., Botella, M., Gaston, A., Folta, K.M., Kilian, A., Denoyes, B., Amaya, J. (2015). Diversity Arrays Technology (DArT) marker platforms for diversity analysis and linkage

mapping in a complex crop, the octoploid, cultivated strawberry (*Fragaria × ananassa*). Plos One DOI: 10.1371/journal.pone.0144960.

Folta, K.M., Carvalho, S.D. p (2015) Photoreceptors and control of horticultural plant traits. *Hortscience*. (in press)

Dr. Stacey Harmer (Renominated by Jen Noble)

Email: slharmer@ucdavis.edu

Institution: University of California, Davis

Lab Website: <http://harmerlab.openwetware.org/>

Research Interests:

“Understanding the molecular basis of circadian rhythms in plants and how these daily rhythms affect plant physiology.”

Keywords: Transcriptional regulation, circadian rhythms, plant physiology, positive and negative regulatory feedback loops

Recent Publications:

- Atamian HS, Creux NM, Brown EA, Garner AG, Blackman BK, Harmer SL. (2016) Circadian regulation of sunflower heliotropism, floral orientation, and pollinator visits. *Science*, 353(6299):587-90.
- Vandenbrink, J.P., Brown, E.A., Harmer, S.L., and Blackman, B.K. (2014) Turning heads: the biology of solar tracking in sunflower. *Plant Sci*. 224:20-6. doi: 10.1016/j.plantsci.2014.04.006.
- Hsu, P.Y., Devisetty, U.K., and Harmer, S.L. (2013) Cycling activators control the evening arm of the plant clock. *eLife*. 2:e00473. doi: 10.7554/eLife.00473.

Couple comments about Stacey: I met her at the Frontiers and Techniques Course in Plant Sciences at Cold Spring Harbor in 2013. She communicates well with graduate students (inside and outside of the lab), and would be a great speaker to select because she genuinely listens to graduate students (regardless of their field of study) and often has great feedback when discussing research projects. Her research is also applicable outside of plant physiology because it deals with complex feedback loops and transcriptional regulation involving multiple (and often redundant) transcription factors. Circadian rhythms also have been shown to have connections to pathogen responses.

Dr. Jonathan Lynch, (Andrea Carter), renomination

Email: jpl4@psu.edu

Institution: Penn State

Research Summary: Dr. Lynch's research focuses on understanding the basis of plant adaptation to drought and low soil fertility. This encompasses physiology, genetics, and ecology, centered on organismic processes. Most of his current work focuses on understanding **root traits** that can be used to breed crops with better acquisition of phosphorus, nitrogen, and water through the Roots Lab of Penn State. The work of the Roots Lab includes crop adaptation to low phosphorus availability, low nitrogen availability, drought, manganese toxicity, and salinity. Of these phosphorus has been a principal focus as this element is a major limitation to life on earth. We have identified several novel plant traits that enhance soil exploration and phosphorus acquisition. Root architectural traits are important for phosphorus acquisition and we have discovered several novel architectural traits that have been useful in crop breeding. More recently we have extended this work into increasing the efficiency of nitrogen and water acquisition by maize.

There has been talk of giving Jonathan an adjunct position at the UofA to allow our students to conduct research at his roots lab in Wilcox- A 40 ha crop research facility that includes a lab equipped for root biology studies. <http://plantscience.psu.edu/research/labs/roots/sites/arbc>

One of the research sites of the Roots Lab is The Apache Root Biology Center (ARBC)- established in 2012 by the Howard G. Buffett Foundation for the **Roots lab located in Willcox, AZ, USA.**

Selected Publications

Burridge J, CN Jochua, A Bucksch, JP Lynch. 2016. Legume shovelomics: high – throughput phenotyping of common bean (*Phaseolus vulgaris* L.) and cowpea (*Vigna unguiculata* subsp, *unguiculata*) root architecture in the field. Field Crops Research, in press.

Dathe A, JA Postma, M Postma-Blaauw, JP Lynch. 2016. Impact of axial root angles on nitrogen acquisition in maize depends on environmental conditions. Annals of Botany, in press.

Gao, YZ, JP Lynch. 2016. Low crown root number improves water acquisition under water deficit stress in maize (*Zea mays* L.). Journal of Experimental Botany. [Full record](#)

Bishopp A, JP Lynch. 2015. The hidden half of crop yields. Nature Plants. [Full record](#)

Dr. Megan Dewdney (Pummi Singh)

Email: mmdewdney@ufl.edu

Institution: University of Florida

Research Summary: Extension responsibilities focus on integrated management and control measures for citrus canker and citrus greening with additional responsibilities for fungal pathogens. Research projects include better understanding the biology of both bacterial and fungal pathogens to lead to enhanced control. At the Citrus Research and Education Center in Lake Alfred, Dewdney developed a program in citrus pathology with an emphasis on foliar fungal pathogens and huanglongbing (HLB). One of the challenges upon arrival was to balance the need for on-going research and extension on fungal diseases with that of HLB. Citrus has historically been a \$9 billion industry in Florida and is a major part of the Central Florida ethos. This iconic industry is now critically threatened by HLB but losses from fungal diseases contribute to the economic malaise. Although her program started with HLB, she was called to concentrate on fungal diseases with discovery of citrus black spot in Florida, an exotic disease, and the development of fungicide resistance with *Alternaria* brown spot, an important tangerine disease.

Latest Publications:

- Vega, B., and **Dewdney, M. M.** 2014. Sensitivity of *Alternaria alternata* from citrus to boscalid and polymorphism in the iron-sulfur and in the anchored membranes subunits of succinate dehydrogenase. Plant Disease 98: (accepted). <http://dx.doi.org/10.1094/PDIS-04-14-0374-RE>.
- Vega, B., and **Dewdney, M. M.** 2014. QoI-resistance stability in relation to pathogenic and saprophytic fitness components of *Alternaria alternata* from citrus. Plant Disease 98: 1371-1378. <http://dx.doi.org/10.1094/pdis-01-14-0078-re>.
- Hincapie, M., **Dewdney, M.M.**, and Peres, N.A. 2014. Baseline sensitivity of *Guignardia citricarpa* isolates from Florida to azoxystrobin and pyraclostrobin. Plant Disease 98: 780-789. <http://dx.doi.org/10.1094/PDIS-03-13-0335-RE>.
- Vega, B. and **Dewdney, M.M.** 2014. Distribution of QoI resistance in populations of tangerine-infecting *Alternaria alternata* in Florida. Plant Disease 98: 67-76. <http://dx.doi.org/10.1094/PDIS-04-13-0449-RE>.
- Hu, J., Wang, N.-Y., and **Dewdney, M.M.** 2014. qPCR quantification of pathogenic *Guignardia citricarpa* and non-pathogenic *G. mangiferae* in citrus. Plant Disease 98: 112-120. <http://dx.doi.org/10.1094/PDIS-04-13-0465-RE>.

2016-2017 academic year - spring semester

Dr. Siobhan M. Brady (Jen, Kelly, Evan, and Junpeng)

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Institution: University of California, Davis

<http://www-plb.ucdavis.edu/labs/brady/index.html>

Research in the Brady lab focuses on understanding how a network of transcriptional interactions regulates tissue development and function. The root of the model plant, *Arabidopsis thaliana*, is ideally suited to study the architecture of transcriptional networks as most cell types are rotationally symmetrical and developmental time can be read along the root's longitudinal axis, facilitating characterization of spatiotemporal development.

Our research regarding the properties of tissue-enriched transcriptional networks can be applied to other organisms to determine the degree to which transcriptional networks that guide tissue development are conserved.

Selected Publications:

Ron M, Kajala K, Pauluzzi G, Wang D, Reynoso MA, Zumstein K, Garcha J, Winte S, Masson H, Inagaki S, Federici F, Sinha N, Deal RB, Bailey-Serres J, Brady SM. (2014) Hairy root transformation using *Agrobacterium rhizogenes* as a tool for exploring cell type-specific gene expression and function using tomato as a model. *Plant physiology* (pp-114).

Taylor-Teeple M, Lin L, de Lucas M, Turco G, Toal TW, Gaudinier A, Young NF, Trabucco GM, Veling MT, Lamothe R, Handakumbura PP, Xiong G, Wang C, Corwin J, Tsoukalas A, Zhang L, Ware D, Pauly M, Kliebenstein DJ, Dehesh K, Tagkopoulos I, Breton G, Pruneda-Paz JL, Ahnert SE, Kay SA, Hazen SP, Brady SM. An *Arabidopsis* gene regulatory network for secondary cell wall synthesis. *Nature*

Ron M, Dorrit MW, de Lucas M, Toal T, Hernandez RI, Little SA, Maloof JN, Kliebenstein DJ, Brady SM. (2013) Identification of Novel Loci Regulating Interspecific Variation in Root Morphology and Cellular Development in Tomato. *Plant Physiol.* 2013 Jun;162(2):755-68. doi: 10.1104/pp.113.217802. Epub 2013 Apr 10.

Dr. Jen Sheen (Kyle Palos)

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Institution: Harvard Medical School

Research Summary: "We are probing plant life by developing simple and powerful tools and strategies to unravel plant signal transduction pathways extending from sensors/receptors to signaling cascades and target genes and proteins that are central to energy and metabolic homeostasis, innate immunity, stress adaptation, cell fate specification, plant shape and architecture determination. Our investigations are guided by our curiosity and the desire to promote the use of green plants as a versatile and fascinating model system for discovering fundamental principles in the regulatory networks of living organisms."

General Research Topics: Sugar sensing and signaling, hormone signaling and transduction, and innate immunity.

Selected Publications:

Asai, Tsuneaki, et al. "MAP kinase signalling cascade in Arabidopsis innate immunity." *Nature* 415.6875 (2002): 977-983.

Xiong, Yan, et al. "Glucose-TOR signalling reprograms the transcriptome and activates meristems." *Nature* 496.7444 (2013): 181-186.

Li, Jian-Feng, et al. "Multiplex and homologous recombination-mediated genome editing in Arabidopsis and Nicotiana benthamiana using guide RNA and Cas9." *Nature biotechnology* 31.8 (2013): 688-691.

Cheng, Zhenyu, et al. "Pathogen-secreted proteases activate a novel plant immune pathway." *Nature* 521.7551 (2015): 213-216.

Dr. Xuemei Chen (Kyle Palos, WEN CHEN)

Email: xuemei.chen@ucr.edu

Institution: University of California, Riverside

Research Summary: "The Chen lab is engaged in research in two major directions. In one, we are studying the biogenesis, degradation, modes of action, and biological functions of noncoding RNAs. In the other, we are dissecting the mechanisms underlying stem cell maintenance and/or termination. We mainly use *Arabidopsis thaliana* as the model, but we also apply insights learned from *Arabidopsis* to animal systems."

Selected Publications:

Li, Shengben, et al. "MicroRNAs inhibit the translation of target mRNAs on the endoplasmic reticulum in Arabidopsis." *Cell* 153.3 (2013): 562-574.

Chen, Xuemei. "A microRNA as a translational repressor of APETALA2 in Arabidopsis flower development." *Science* 303.5666 (2004): 2022-2025.

Yu, Bin, et al. "Methylation as a crucial step in plant microRNA biogenesis." *Science* 307.5711 (2005): 932-935.

Ramachandran, Vanitharani, and Xuemei Chen. "Degradation of microRNAs by a family of exoribonucleases in Arabidopsis." *Science* 321.5895 (2008): 1490-1492.

Dr.Themis J Michailides (Pummi Singh)

Email: tjmichailides@ucanr.edu

Institution: University of California, Davis

Research Summary: We are currently involved in research to manage Alternaria late blight disease of pistachio by cultural and chemical control approaches. A major portion of my research is devoted on the biology of Botryosphaeria dothidea, the pathogen causing panicle and shoot blight of pistachio, band canker of almond, and a severe shoot blight in walnut. We are also investigating the epidemiology of Botryosphaeria blight as affected by weather and its management by cultural, chemical, and integrated approaches. Another aspect of this research involves the development of disease models and prediction of disease risk based on inoculum levels and weather conditions. We are also involved in phylogenetic studies of Botryosphaeria spp. attacking nut crops as well as in using molecular and conventional techniques to detect and predict these diseases. A large portion of our research is devoted to the detection of pathogens, such as Monilinia fructicola (stone fruit), Botrytis cinerea (grapes, kiwifruit, pome and stone fruit, figs, and pomegranates), Alternaria alternata and other Alternaria spp. (pistachio), B. dothidea and Fusicoccum sp. (pistachio, almond, walnut, and other tree hosts), Aspergillus niger and A. flavus (pistachio, figs, grapes, and raisins), using either conventional techniques and for some of these pathogens molecular techniques. Another major project involves the study of the survival of Monilinia fructicola, the pathogen causing brown rot, prediction of the disease risk, and management of the disease by cultural and biological methods. Another project involves the study and understanding of the life cycle and infection of nut crops and figs by the aflatoxigenic fungi Aspergillus flavus and/or A. parasiticus and the development of methodology to help reduce or eliminate aflatoxin contamination in these crops. In the last 5 years emphasis was given in using an atoxigenic A. flavus strain AF36 to displace the toxigenic A. flavus and A. parasiticus in pistachio and fig orchards and an Experimental Use Permit (EUP) application has been submitted for treating initially 3,000 acres of pistachios.

Latest Publications:

Karaoglanidis, G., and Michailides, T. J. Competitive ability and fitness of *Alternaria alternata* isolates resistant to QoI fungicides. Plant Disease (accepted).

Moral, J., Muñoz-Diez, C., Gonzalez, N., Trapero, A., and Michailides, T. J. Genetic, morphological and pathogenic Diversity of *Botryosphaeria* species from olives in Spain and California. Phytopathology 100:1340-1351.

Inderbitzin, P., Bostock, R. M., Trouillas, F. P., and Michailides, T. J. A six locus phylogeny reveals high species diversity in *Botryosphaeriaceae* from California almond. Mycologia 102:1350-1368.

Dr. Jenny Kao-Kniffin (Seth Steichen)

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Institution: Cornell University

Research Summary:

1. Selection of rhizosphere microbiomes that modulate plant traits

Our goal is to understand the functional role of root-associated microbial communities in modulating plant traits. We are assembling microbial communities that modulate plant traits across generations of selective pressure. We are specifically examining shifts in microbial community composition across the different plant phenotypes, in relation to soil and plant functional variables, in hopes of developing cropping systems that interact with their microbiomes to enhance desirable plant traits.

2. Identifying novel biosynthetic metabolites from rhizosphere microorganisms contributing to plant growth or inhibition

The rhizosphere harbors many soil microorganisms that directly enhance or inhibit plant growth. We are using a combination of cultivation-dependent and cultivation-independent molecular methods to isolate and assess secondary metabolites produced by rhizosphere microorganisms. We plan to isolate compounds produced from rhizosphere microorganisms that can impact the management of weed populations.

3. Assembly of plant-microbial communities that enhance ecosystem services

Diverse plant communities can enhance ecosystem services by minimizing nutrient exports, minimizing weed invasion in dense vegetated canopies, and stimulating microbial growth and activity. We are studying how the composition of plant communities enhances nitrogen retention and plant community productivity.

Publications of interest:

Panke-Buisse, K., A. Poole, J. Goodrich, R. Ley, and J. Kao-Kniffin. 2014. [Selection on soil microbiomes reveals reproducible impacts on plant function](#). The ISME Journal. DOI: 10.1038/ismej.2014.196

Kao- Kniffin, J. and T.C. Balser. 2007. [Elevated CO₂ differentially alters belowground plant and soil microbial community structure in reed canary grass-invaded experimental wetlands](#). Soil Biology & Biochemistry 39:517-525. DOI:10.1016/j.soilbio.2006.08.024

Thompson, G. and J. Kao-Kniffin*. 2016. [Diversity enhances NPP, N retention, and soil microbial diversity in experimental urban grassland assemblages](#). PLOS One DOI:<http://dx.doi.org/10.1371/journal.pone.0155986>

Carver, S., Nikulin, N. and J. Kao-Kniffin*. 2016. [Uncovering plant growth-mediating allelochemicals produced by soil microorganisms](#). Weed Science 64:119-128 DOI: <http://dx.doi.org/10.1614/WS-D-15-00095.1>

Dean Gabriel - University of Florida (Mana Ohkura)

<http://plantpath.ifas.ufl.edu/faculty/dean-gabriel/>

I felt the description on the website doesn't do justice so here is an additional plug from me! He gave an interesting talk at the American Phytopathological Society meeting about the Citrus Greening pathogen, *Candidatus Liberibacter asiaticus*, a non-culturable bacterium that is transmitted by psyllids. He has discovered that the disease not only involves the bacterium and the vector, but a phage as well. The phage appears to regulate the genes of either the bacterium or the host (sorry, I forgot the details), which enables the bacterium to cause disease. He also shared a preliminary finding that the pathogen is only recovered from psyllids that contain *Wolbachia* in their guts suggesting that the presence of *Wolbachia* may be crucial for the disease to occur. I thought the talk was neat because he not only talked about a multitrophic interaction, but went into how the different organisms regulate each other's genes.

Research area (from the website):

Research in my lab is in the areas of genetics, physiology and molecular biology of plant/microbe interactions. We are currently working on the structure, function and expression of cloned pathogen virulence genes, especially those involving citrus canker disease, cotton blight and common bean blight. Citrus canker disease is a quarantined pathogen in the U.S. and must be kept under BL-3 physical containment. We are working on methods to block pathogen signal molecules transferred to the plant nucleus. We have research projects to engineer resistance to bacterial pathogens and insect pests. Other projects involve research on the population structure, epidemiology, taxonomy, and detection of *Xanthomonas*. Graduate students in my lab have the option of majoring in either Plant Pathology or Plant Molecular and Cell Biology. I teach on the subjects of microbial genetics, population genetics, host/parasite interactions, and resistance gene management in two formal courses: "PLP6502, Genetics of Plant/Microbe Interactions" and "PCB5065, Advanced Genetics."

Wulff, NA, Zhang, S, Setubal, JC, Almeida, NF, Martins EC, Harakava, R, Kumar, D, Rangel, LT, Foissac, X, Bove, J, Gabriel, DW. 2014. The complete genome sequence of *Candidatus Liberibacter americanus*, associated with citrus Huanglongbing. *Mol Plant Microbe Interact.* 27:163-176. Epub ahead of print] PMID: 24200077.

Fleites LA, Jain M, Zhang S, Gabriel DW. 2014. *Candidatus Liberibacter asiaticus* prophage late genes may limit host range and culturability. *Appl Environ Microbiol.* 80:6023-30.

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Past Invited speakers (2011~)

Dr. Nathan Springer	University of Minnesota,	9/13/11
Dr. Ravi Palanivelu	University of Arizona	9/20/11
Dr. Brett Tyler	Virginia Bioinformatics Institute	9/27/11
Dr. Mark Tester	Australian Centre for Plant Functional Genomics	10/4/11
Dr. Judith Carney	University of California, Los Angeles	10/18/11
Dr. Stephen Goff	iPlant Collaborative, U of A	10/25/11
Dr. Jeffrey Chen	University of Texas Institute for Cellular and Molecular Biology	11/1/11
Dr. Joel Cuello	University of Arizona	11/8/11
Dr. Keith Slotkin	Ohio State University	11/15/11
Dr. Frank Louws	North Carolina State University	12/6/11
Dr. Meredith Blackwell	Louisiana State University	1/13/12
Dr. Martin Lysak	Masaryk University, Czech Republic	1/20/12
Dr. Jan Dvorak	UC Davis, Department of Agricultural Plant Biology	1/24/12
Dr. Luca Comai	UC Davis, Genome Center	1/31/12
Dr. Istvan Molnar	University of Arizona	2/3/12
Dr. Lena Hileman	University of Kansas	2/7/12
Dr. Xuelu Wang	School of Life Sciences Fudan University, China	2/8/12
Dr. Matthew Jenks	U.S. Arid Land Agricultural Research Center	2/14/12
Dr. Katherine Borkovich	UC Riverside	2/21/12
Dr. Stephen Wright	University of Toronto	2/28/12
Dr. George Abawi	Cornell University	3/2/12
Dr. Detlef Weigel	MPI for Developmental Biology, Tuebingen	3/6/12
Dr. Ingrid Parker	UC Santa Cruz	3/20/12
Dr. Andrew P. Capaldi	University of Arizona	3/23/12
Winthrop Professor Wallace A. Cowling	UWA Institute of Agriculture - University of Western Australia	3/27/12

Dr. William F. Thompson	North Carolina State University	3/27/12
Dr. Lindy Brigham	University of Arizona	3/30/12
Dr. Elizabeth Pierson	Texas A&M University	4/2/12
Dr. Dorothy Shippen	Texas A&M University	4/3/12
Dr. Katrina Dlugosch	University of Arizona	4/10/12
Dr. Rachel Gallery	University of Arizona	4/13/12
Dr. Haibao Tang	J. Craig Venter Institute	4/17/12
Dr. Cary Mitchell	Purdue University	4/24/12
Dr. Jeffrey Chang	Oregon State University	5/1/12
Mariana Del Olmo Ruiz		8/2/12
Megan McDonald	Swiss Federal Institute of Technology	8/13/12
Dr. Jixun Zhan	Utah State University	9/7/12
Dr. Molly Hunter	University of Arizona	10/9/12
Dr. Damian Gessler	iPlant Collaborative	10/16/12
Dr. Ray Riley	Syngenta Seeds, Inc.	10/30/12
Dr. Noah Whiteman	EEB	11/2/12
Dr. Hormoz BassiriRad	University of Illinois at Chicago	11/6/12
Dr. Louise Rollins-Smith	Vanderbilt University	11/12/12
Dr. Charles Gerba	SWES	12/4/12
Drs. Masami Hirai and Yuji Sawada	RIKEN Plant Science Center, Japan	1/11/13
Dr. Wendy Hodgson	Desert Botanical Garden	1/22/13
Dr. Xiao Wang	Arizona State University	1/29/13
Dr. Michael Gore	USDA	2/5/13
Carlos Maldonado		2/19/13
Dr. Kobus Barnard	Science, Technology and Arts	2/19/13
Dr. Bing Yang	Iowa State University	2/26/13
Dr. Mark Johnson	Brown University	3/1/13
Dr. Brian Gregory	University of Pennsylvania	3/5/13
Dr. John Doebley	University of Wisconsin-Madison	3/19/13
Dr. Ryan Gutenkunst	University of Arizona	3/26/13

Dr. Matthew Sullivan	EEB	4/9/13
Dr. Alessandro Vitale	CNR Istituto de Biologiae Biotechnologia, Milan, Italy	4/12/13
Dr. Jonathan Lynch	Penn State University	4/30/13
Erik van den Bergh	Wageningen University	5/21/13
Dr. Nathalie Nagalingum	Royal Botanical Garden Sydney	9/3/13
Dr. Jean McLain	University of Arizona	10/1/13
Dr. Dragos G. Zaharescu	Biosphere 2, University of Arizona	11/5/13
Matthew B. Johnson	University of Arizona	11/12/13
Dr. Michael Sanderson	EEB	11/19/13
Dr. Frans Tax	MCB	12/3/13
Dr. Sheng-Yang He	Michigan State University	12/10/13
Dr. Olivier Panaud	University of Perpignan	1/15/14
Dr. Tae-Jin Yang	Seoul National University	1/17/14
Dr. Nilsa Bosque-Perez	University of Idaho	1/28/14
Dr. Dae-Jin Yun	Gyeongsang National University	2/11/14
Dr. Scott Gold	USDA- Athens, GA	2/11/14
Dr. Eva Huala	Stanford University	2/18/14
Dr. Leon Kochian	Cornell University	3/4/14
Dr.Durgadas P. Kasbekar	Centre for DNA Fingerprinting & Diagnostics, India	3/11/14
Dr. Joan Bennett	Rutgers University	3/14/14
Dr. Nabil Killiny-Mansour	Univeristy of Florida	3/24/14
Dr. Michael Freeling	University of California at Berkeley	3/25/14
Dr. Claire Aslan	Arizona-Sonora Desert Museum	4/1/14
Dr. Adebosola Oladeinde	Bill and Melinda Gates Foundation	4/11/14
Dr. Kevin Fitzsimmons	College of Agriculture and Life Sciences International Programs	4/15/14
Dr. Sharon Long	Stanford University	4/22/14
Dr. Mel Oliver	USDA	5/6/14
Dr. Fiona McCarthy	School of Animal and Comparative Biomedical Sciences	9/23/14

Dr. Bonnie Hurwitz	Department of Agricultural and Biosystems Engineering	10/21/14
Dr. Leon Kochian	Cornell University	10/28/14
Dr. Emmanuel Guiderdoni	CIRAD	11/18/14
Dr. Jan Leach	Colorado State University	11/19/14
Dr. Jeremy Edwards	USDA-Dale Bumpers Rice Research Center	11/21/14
Dr. Vicki Chandler	Gordon and Betty Moore Foundation	11/25/14
Dr. Volker Brendel	Indiana University	12/2/14
Dr. John Dyer	US Arid-Land Agricultural Center, Maricopa, AZ	12/9/14
Dr. Paul Wallace	Arizona Research Labs	2/17/15
Dr. Uwe Hilgert	iPlant	2/24/15
Dr. Gillian Turgeon	Cornell University	3/3/15
Dr. Matthew Ogburn	Southern Utah University	3/10/15
Dr. Gregory Gilbert	University of California-Santa Cruz	3/24/15
Dr. Erich Grotewold	Ohio State University	4/7/15
Saeid Shahidi	Simon Fraser University	4/24/15
Dr. Ann M. Lynch	USDA Forest Service	4/28/15
Dr. Paula Kahn-Rivadeneira		5/5/15
Dr. Jason Stajich	University of California-Riverside	9/8/15
Dr. Benjamin Schwessinger	Australian National University	9/15/15
Mark Siegarth	Boyce Thompson Arboretum	9/22/15
Dr. Melissa A. Wilson Sayres	Arizona State University	9/29/15
Dr. Venkatesan Sundaresan	University of California-Davis	10/13/15
Dr. Wenbo Ma	University of California-Riverside	10/20/15
Dr. Aaron Liston	Oregon State University	10/27/15
Dr. Brian Kvitko	University of Georgia	11/3/15
Dr. Joanne Dannenhoffer	Central Michigan University	11/17/15
Dr. Ken Olsen	Washington University in St. Louis	11/24/15
Dr. Siobain Duffy	Rutgers University	12/1/15
Dr. Emily Troemel	University of California at San Diego	12/8/15

Dr. Steven Lindow	University of California Berkeley	1/19/16
Dr. Ksenia Krasileva	University of Cambridge	2/9/16
Dr.Xuelu Wang	Huazhong Agricultural University	2/16/16
Dr. Catherine Gehring	Northern Arizona University	2/16/16
Dr. Andrew Doust	Oklahoma State University	3/1/16
Dr. Stacy Bonos	Rutgers University	3/8/16
Dr. Chelsea Specht	University of California Berkeley	3/22/16
Dr. Luciano Matzkin	University of Alabama	3/24/16
Dr. John McKay	Colorado State University	3/29/16
Dr. Jeremy Yoder	University of British Columbia	4/5/16
Dr. Chris Muir	Indiana University	4/7/16
Dr. Xinnian Dong	Duke University	4/8/16
Dr. Jeffrey Ross-Ibarra	University of California-Davis	4/12/16
Dr. Frank (Andy) Jones	Oregon State	4/14/16
Dr. Gina Baucom	University of Michigan	4/26/16
Kestrel McCorkle	NC State University	5/10/16
Dr. Periasamy 'Ravi' Chitrampalam	North Dakota State University	5/24/16
Dr. Jiahuai 'Alex' Hu	University of Florida	5/26/16
Daniel Sloan	Colorado State University	10/18/16
Shaun Bushman	USDA- Logan Utah	11/1/16
Michael Axtell	Penn State University	11/15/16
Todd Mockler	Donald Danforth Plant Sciences Center	11/22/16
Dr. Anne Britt	University of California Davis	11/30/16
Anna Dobritsa	The Ohio State University	12/6/16
Dr. Etti Orr	Volcani Institute,Israel	1/24/17
Ivan Baxter	Danforth Institute	2/14/17
Leslie Sieburth	University of Utah	3/7/17
Emily Indriolo	New Mexico State University	3/21/17
Themis Michailides	University of California Davis	3/28/17
Linda Kinkel	University of Minnesota	4/4/17

Douglas Cook	University of California Davis	4/18/17
Andrew Leahey	University of Illinois	5/2/17