



## Graduate Student Spotlight

# Claire Heinitz

I grew up in the Mojave Desert, and when I entered the University of Arizona I didn't even know that "plant science" was a science, nor did I know anything about plant breeding. However, through a series of happy accidents, by the end of my freshman year I was a Plant Science major and working in both a breeding lab and the campus Arboretum.

My first experience in agronomy and breeding was working with two little-known crops, guayule and lesquerella, which we were developing for use as industrial crops on marginal land. I was satisfied knowing that we were serving a larger purpose providing domestic alternatives to fossil fuels, but what I really loved was the daily mix of basic plant biology, advanced genetics, pragmatic selection, and dirty fieldwork that were all required for a successful breeding program.

When I started thinking about graduate school, my professor advised me to simply pick an interesting crop, and go find the best program for that crop – which is how I ended up in Professor Walker's grapevine breeding lab at UC Davis. Again, I didn't know anything about viticulture when I arrived, but showing up without any specific and deliberate project ideas about what I wanted to study allowed me the freedom to form my perfect project. There was no way I could have predicted that Dr. Walker was waiting for someone with a background in genetics and botany to collect and characterize wild grapes from Arizona.

Over the past 6 years, we added over 600 unique accessions from throughout the southwest U.S. to our germplasm collection. This collection is an important source of genetic diversity for our rootstock breeding program, providing both biotic and abiotic stress resistance traits. Unfortunately, the genetic composition of these populations is complicated and poorly understood due to high levels of interspecies hybridization, and fragmented, remote habitats. Because of this, my dissertation has been split between the pre-breeding

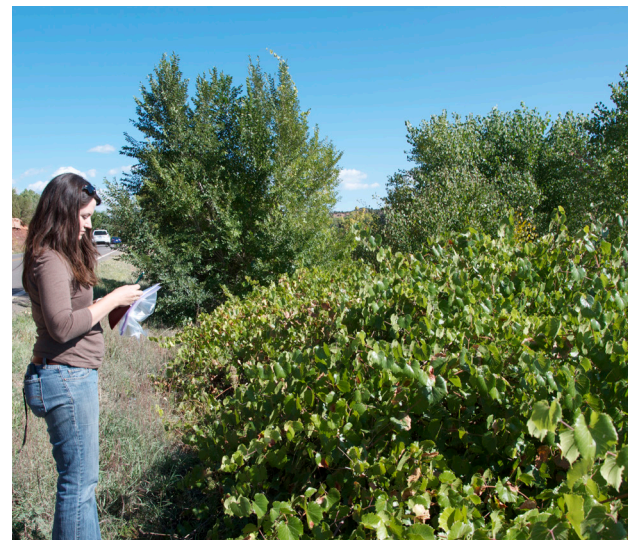
task of screening the collections in the greenhouse for salt tolerance, and using an ecological genetics framework to understand the population structure. I used highly variable microsatellite markers to define functional genetic units for breeding and to identify hybrid zones and other areas of ecological interest. Combined with the greenhouse screening, these results have allowed us to begin making crosses to established rootstock varieties. Other lab members are working on characterizing the collection for additional traits, such as drought tolerance and nematode resistance.

My experience building, maintaining, and characterizing a germplasm collection at UC Davis has prepared me to move into a position with the USDA as a germplasm curator. I will be working with the USDA arid lands

plant collection in Parlier, CA, which includes many emerging industrial crops – in addition to some of the same crops I had worked with at the University of Arizona. In my new position, I will be interfacing between industry groups, breeders, and plant physiologists, as well as other USDA curators. I feel UC Davis prepared me well for this experience by fostering access to many different interdisciplinary groups. Within the Viticulture and Enology department, I learned about the industry we serve as breeders and developed relationships with students (future industry members) through teaching. As a member of the Horticulture and Agronomy graduate group, I met students working on a broad range of crops and learned about agriculture in California as a whole. Finally, being part of a loose affiliation of plant breeding students showed me different perspectives and breeding challenges from students across graduate groups. Now that we have a more formal group based around the Plant Breeding Center, this experience will be improved further for incoming students.

Though it seemed arbitrary at the time, I'm very glad I decided to come to UC Davis without a plan for exactly what I wanted to study. My best advice for new students is to keep focus on your interests and strengths, but stay flexible about project specifics, collaborations, or even your cropping system. I found that exploring a central theme through the lens of different disciplines and crops opened me up to thinking about my project in a new way, and ultimately gave me more career options. I was also very lucky to be part of a lab with many permanent staff members, whose long-term knowledge and investment in the breeding program makes it feasible for students to complete projects in a reasonable amount of time. I am very grateful to Prof. Walker, Kevin Fort, Summaira Riaz, and Nina Romero for continuing to support me (and my giant plant collection) into the future!

-Claire Heinitz





## UC DAVIS NEWS

### NEW ORGANIC PLANT BREEDING EFFORT TO PRODUCE NOVEL VARIETIES AND TRAIN NEW BREEDERS

- UC DAVIS NEWS, AUBREY WHITE

Last month, we announced that the UC Davis had been awarded a grant from USDA NIFA for the Organic Agriculture Research and Extension Initiative. The project, developed by the Plant Breeding Center and the



Student Farm, will develop an experiential learning-based public plant breeding pipeline for organic cultivar development.

As part of the OREI project, local organic growers came together with UC Davis plant breeding researchers and graduate students at a meeting held on November 13th to share their ideas and suggestions. The graduate and undergraduate student teams gave presentations on the history of UC Davis breeding projects and the available germplasm, focusing on the development of tomato, jalapeño pepper, and dry bean varieties. The meeting concluded with a tour of the Student Farm.

[>>> OREI Press Release](#)

### NATIONAL NEEDS GRADUATE FELLOWSHIP PRIORITY DEADLINE JAN. 5TH, 2016

-PLANT BREEDING CENTER

The University of California, Davis received funding from the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) for a National Needs Graduate Fellowship (NNF) grant to fully support two Masters-level and



two Doctoral-level Graduate Research Assistantships. The four positions are available in Fall 2016 through a joint collaboration of the Plant Breeding Center and the Horticulture and Agronomy Graduate Group. Candidates for NNF funding will be chosen from the entire pool of applicants to the Horticulture and Agronomy Graduate Group at UC Davis, with a focus on historically underrepresented minorities. The priority deadline for Graduate program applications is January 5th, 2016.

[>>>read more](#)



## OPPORTUNITIES AND EVENTS

### SECOND ANNUAL COMMUNITY FILM SCREENING THE MESOAMERICAN DIET: ORIGINS

JANUARY 28, 6:00-8:30PM

AUDITORIUM 1001, GENOME CENTER

UC DAVIS CAMPUS

The Plant Breeding Center will be presenting a screening of the documentary "The Mesoamerican Diet: Origins" at our second annual community film screening event. This event is free and open to all community members, including people not affiliated with UC Davis. This film discusses how Mesoamerican cultures developed traditional cuisines that were diverse, nutritious and balanced. Their findings suggest that the recreation of this diet can surmount the dire issues of diabetes, obesity, and loss of biocultural diversity resulting from modern diets high in processed foods containing saturated fats, fiber-free flours, sugars, and carbohydrates. Executive Producers Daniel Zizumbo and Patricia Colunga will also be taking questions via Skype following the screening.

For a trailer of the film in English, click [here](#).

To register for the screening, click [here](#).

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### 8TH ORGANIC SEED GROWERS CONFERENCE: "CULTIVATING RESILIENCE"

FEBRUARY 4-6, 2016

OREGON STATE UNIVERSITY

The Organic Seed Alliance, along with Oregon State University, Washington State University, and eOrganic, have put together the largest organic seed event in the United States. Attendees will have the opportunity to expand seed knowledge and skills, hear the latest in scientific research, and discover new resources and tools. There will also be a UC Davis and Student Farm presence at the conference to represent the OREI grant. For details and registration, click [here](#).

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### POPULATION, EVOLUTIONARY, & QUANTITATIVE GENETICS MEETING (PEQG)

JULY 13-17, 2016

ORLANDO WORLD CENTER MARRIOTT, FL

The meeting will be held in conjunction with The Allied Genetics Conference (TAGC) and offers a unique opportunity to network with other researchers from various fields of genetics and share findings. PEQG will also provide graduate students with the chance to explore post-doctoral interests in other fields, and postdocs the opportunity to network with faculty from other institutions. For more information, click [here](#).

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