



Graduate Student Spotlight Viviana Medina

I am Viviana Medina, a fifth year Ph.D. student in the Horticulture and Agronomy Graduate Group. My path toward UC Davis was not a straight one. Things are changing now, but in Puerto Rico, where I grew up, agriculture has always had a negative connotation. You don't go to college to farm, you go to college to become a doctor, a lawyer, or an engineer. While I loved being outside on farms, I never considered a career in agriculture. I was convinced my true calling was to become an environmental lawyer. I went to the University of Florida to pursue a Bachelor's degree in Environmental Science with a minor in agricultural law. Not long after taking law classes I realized it was not for me, but the agricultural classes required for the minor did lead me in the right direction.

One of my classes gave me the opportunity to travel to Honduras to evaluate farms and agricultural systems, and I was able to visit Zamorano Agricultural University. I loved Zamorano's "learning by doing" system so much that I returned the next summer for an exchange program. Their commitment, dedication and passion for research was contagious. This experience truly cemented my path toward agricultural research.

After I received my Bachelor's degree, I took a year off to travel around South and Central America to experience a diversity of agricultural systems. During my interactions with growers and researchers I always heard about UC Davis and what a great agricultural school it was. After deciding agricultural research was what I loved, I applied to UC Davis and thankfully was accepted!

I initially started my Ph.D. work with a joint collaboration between UC Davis and the MARS Center for Cacao Science in Bahia, Brazil. I surveyed plantations transitioning from agroforestry-type to full-sun production systems, and evaluated the effects on metabolite composition and flavor profiles of cacao beans, but the project was discontinued after two years and I had to change directions. This led to my new path working on common beans in the Whole Plant Physiology lab with Dr. Matthew Gilbert.

As a physiologist, I take a holistic approach to understanding the underpinnings of plant responses to stress by analyzing the physical, chemical, and biological responses. Specifically, my work has focused on evaluating the response of leguminous crops to drought in order to identify which traits allow certain genotypes to excel under limited water supplies. The collaborative atmosphere fostered at UC Davis allowed me to use an interdisciplinary approach to my research with the UC Davis Bean Breeding program. Together, we have explored the genetic and phenotypic variation of drought and heat tolerance within selected lines from CIAT and USDA's *Phaseolus* collections. Once important traits are identified, they will be used as guiding principles for breeding new resilient cultivars. Our studies have shown that, despite with the wide diversity of lines we have evaluated, the reproductive aspects such as pollen viability, changes in phenology, and carbohydrate redistribution appear to have a greater effect in providing water deficit stress tolerance. These results suggest that more emphasis should be put on improving reproductive allocation under water stress in annual crop breeding programs.

The collaboration with the Bean Breeding program has made me realize the importance of plant breeding for the future of crop production, but most importantly I have come to understand the value and potential that collaborative research has. Being able to actively engage with individuals in other areas of expertise has allowed me to think about my project in a more holistic manner. I strongly encourage students to take advantage of these resources. Not only have I made life-long friendships at UC Davis, I have also made countless professional connections that one can only get at such an eminent institution.

I have always been taught that "to whom much is given, much is expected." Therefore, I feel it is my duty as an academic to transfer the knowledge I

have been given by such great faculty here, and provide for those who haven't had the opportunity. This is why, aside from my thesis work, I have also tried to stay active in social projects, such as a Blum grant that allowed me to travel to the Dominican Republic and establish an irrigation system. Students should take advantage of the opportunities offered by UC Davis, and apply for international travel grants like Blum, RIFA, and Trellis, which are great opportunities for students not just to get out of the lab, but also help put one's research in perspective. Most importantly, they allow you to put your skills in action for the benefit of those that need them most.

I want to take this opportunity to especially thank my adviser, Dr. Matthew Gilbert. He truly exemplifies what a mentor should be. He always provides the right amount of guidance, while giving me enough independence to make mistakes and learn from them. My collaborators have also been of great support throughout this process. Thank you to the UC Davis Bean Breeding program, especially Jorge Berny, Sarah Dohle, Antonia Palkovic, and Dr. Gepts. My undergraduate help from Jessica Orozco, Maggie Hsung, and Rafael Aita was invaluable. Lastly, thanks to all the greenhouse and field staff that always made the extra effort to help make my projects successful.

To any students who are feeling lost, there is hope! When it seems like you are not going anywhere, just keep pedaling on - if anything else, you are burning calories. Take it from someone who took a very winding road to get to where they are now.



TACKLING GLOBAL HUNGER WITH CAMBODIAN VEGETABLES

- HUFFPOST IMPACT

A farmer and a pregnant mother, Dek Huon plants seedlings by hand as temperatures rise to 100 degrees in Siem Reap, Cambodia.



Yard long beans are one of five crops she cultivates on her small farm through conservation agriculture, an approach that seeks to leave the soil undisturbed while improving long-term yields. By combining the reduced soil tillage with crop rotation and mulch, conservation agriculture often improves soil structure, moisture retention, and soil health. Dek Huon and other Cambodian farmers are applying the practice in a new way: drip irrigation, which conserves water as well as physical health.

[...]

Dek Huon is one of many farmers learning new practices like conservation agriculture through a research project supported by the Feed the Future Innovation Lab for Collaborative Research on Horticulture (Horticulture Innovation Lab) at the University of California, Davis.

[>>>read more](#)

SAVING CALIFORNIA'S CITRUS

- COMSTOCK'S

Mandarins dominate commercial citrus production in the foothills, where oranges, lemons, limes, grapefruit and kumquats also flourish. Last month, citrus growers in Placer County and surrounding regions were given a dire warning to safeguard their industry: Do not move outside citrus into this county — no matter where it is from.



[...]

Two scientists from UC Davis are on the case. They are collaborating with researchers from other universities on a U.S. Department of Agriculture grant to figure out how to address citrus greening through genetic engineering, according to Dr. Bryce Falk, a plant pathologist in the College of Biological Sciences at UC Davis. Once the technologies are developed, the next step will be their implementation.

[>>>read more](#)

**THIRD THURSDAY
PROFESSOR TOM GRADZIEL
MAY 19TH, 2016
4334 PUTAH CREEK RD,
WINTERS, CA**

The Wolfskill field trip will be an introduction to the unique opportunities and challenges of breeding clonal fruit varieties. Most commercial sweet orange varieties, for example, are mutations of a single genotype which is an interspecific hybrid between the grapefruit-like pomelo and the lemon-like citron. They are also apomictic. We will discuss how to breed for resistance to things like citrus-greening disease, which is decimating Florida production and threatening California. Other tree crops available for discussion include pistachio, fig, cherry, peach, apricot, loquat and mulberry. Register [here](#).

**PBC SEMINAR: DR. STEVE JONES
MAY 24TH, 2016
PES 3001**

The Bread Lab at Washington State University breeds wheat for local systems outside of the commodity market. By working with local millers, bakers, maltsters, brewers, distillers and chefs the lab can experiment with wheats and other grains that don't fit an industrial model but do keep value where it is produced – in regional communities. Register [here](#).

**SYNGENTA AGRICULTURAL SCHOLARSHIP
DEADLINE: MAY 26, 2016**

Available to U.S. land-grant university students currently pursuing bachelor's or master's degrees in crop-related disciplines. Students can apply by submitting a 750- to 1,000-word essay for a chance to win part of the \$20,000 in available awards. Visit: <http://bit.ly/1e39al8>

**13TH ANNUAL SOLANACEAE CONFERENCE
SEPTEMBER 12-16, 2016**

To register, click [here](#).

**NAPB 2016 ANNUAL MEETING
AUGUST 15-18 2016,
RALEIGH, NC**

To register, click [here](#).

PLANT BREEDING CENTER:

Director - [Charlie Brummer](#) - ecbrummer@ucdavis.edu

Associate Director - [Allen Van Deynze](#) - avandeynze@ucdavis.edu

Program Representative - [Amanda Pietras](#) - ampietras@ucdavis.edu

Student Assistant - [Candice Tandiono](#) - cmtandiono@ucdavis.edu



UC Davis Plant Breeding Center



@UCDplantbreeding