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Research Experience

2017-2019. Postdoctoral Researcher. Dept. of Plant Pathology and Microbiology, Iowa State University.
We are developing a disease model for the incidence of Damping-off caused by *Pythium* spp. in Soybeans (*Glycine max*).

2013- 2017. PhD student, Dept. of Plant Pathology and Microbiology, Iowa State University
My graduate research in Alison Robertson's Lab is funded by the Iowa Soybean Association. I evaluated the efficacy of soybean seed treatments for control of seed rot and root rot caused by *Pythium* spp. in small plot and on-farm field trials in an effort to provide Iowa soybean farmers with recommendations regarding seed treatments. I conducted growth chamber studies to improve our understanding of the interaction between cold stress and incidence of *Pythium* diseases and thereby develop improved management recommendations. Soybean farmers in Iowa often plant their crops when soils are below 10 °C (50F) and consequently the risk of stand loss due to damping off by *Pythium* may be high.

2011-2013. Assistant Scientist, Research Department, Dole, Costa Rica

I was responsible for research projects regarding disease and pest control in Bananas under the guidance of Senior Scientists Dr. Marco Castro and Dr. Gregorio Leandro. We evaluated the efficacy of fungicides for Black Sigatoka (*Mycosphaerella fijiensis*) control. We also evaluated insecticides and alternative products for managing banana mealybug (*Pseudococcus elisae*) and scale (*Diaspis boisduvalii*) infestations. Lastly, we assessed various nematicides for banana plant parasitic nematode (*Radopholus similis*) control and herbicides for weed control.

2006-2010. MS student, University of Costa Rica

My MS thesis focused on the diagnosis of postharvest diseases and evaluation of postharvest fungicides to preserve the quality and shelf life of exotic tropical fruit such as Peach Palm (*Bactris gasipaes*). We tested the effect of harvest indices, storage temperatures, waxes and modified atmospheres on chilling injury, respiratory rate, sugar content, internal and external color. We determined Peach Palm was a non-climacteric fruit with a particularly high respiration rate resulting in a very short shelf life (4 to 6 days at room temperature) and it was highly susceptible to fruit rot caused by *Thielaviopsis paradoxa*. My research found the shelf life of this fruit could be extended up to 14 days with storage at 15 °C and the use of postharvest fungicides. The fruit was susceptible to chilling injury at temperatures below 13 °C.

Education

2017-....MS Statistics, Iowa State University.

2013-2017 PhD Plant Pathology and Microbiology, Iowa State University.

2010 MS Crop Protection, University of Costa Rica.

2003 BS Agronomy, University of Costa Rica.

2008 BA Music (Classical Guitar), University of Costa Rica.

Presentations at Symposiums and Conferences

Aug 2019. APS Annual Meeting. Cleveland, OH. Abstract and Poster: *Pythium sylvaticum* delays soybean emergence and increase seed loss at high soil moisture.

- Aug 2017. APS Annual Meeting. San Antonio, TX. Abstract and Poster: The effect of cold stress on Damping-off of soybean caused by *Pythium sylvaticum*.
<https://apsnet.confex.com/apsnet/2017/meetingapp.cgi/Paper/4942>
- Feb 2017. Iowa Soybean Association Research Conference. Oral Presentation: Using seed treatments to manage soybean disease. (Co-presented with Alison Robertson).
- Aug 2016. APS Annual Meeting. Tampa, FL. Abstract and Poster: Cold stress at planting increase susceptibility to damping-off caused by *Pythium sylvaticum*
http://www.apsnet.org/meetings/Documents/2016_meeting_abstracts/aps2016_387.htm
- Aug 2015. APS Annual Meeting. Pasadena, CA. Abstract and Poster: Chilling injury during imbibition of soybean seed increases incidence of damping-off caused by *Pythium torulosum*.
http://www.apsnet.org/meetings/Documents/2015_meeting_abstracts/aps2015abP141.htm
- Jul 2009. International Society for Horticultural Science. First International Conference on Postharvest and Quality Management of Horticultural Products. San José, Costa Rica. Oral presentation: Postharvest Physiology, Chemical Composition and Antioxidant Capacity of Peach Palm Fruit (*Bactris gasipaes* Kunth cv. Darién) at three different harvesting times.
- Sep 2006. Costa Rica Board of Agronomy. XII National Symposium of Agronomy and Natural Resources. Oral presentation: Some postharvest characteristics of five diploids (*Musa* AA) and four triploids (*Musa* AAA, AAB) bananas.

Peer-reviewed Publications

- Robertson, A.E., **Serrano, M.**, Acharya, J., Shriver, J., Beckman, J., Huffman, C., Pecinovsky, K., Rees, M., Schaben, D., Schnabel, M., Sievers, J., Tuttle, T. The effect of foliar fungicides applied at tasseling on stalk lodging in corn. Plant Health Progress (submitted).
- Serrano, M., Robertson, A.E. 2017. The effect of cold stress on Damping-off of soybean caused by *Pythium sylvaticum*. Plant Disease 102:2194-2200.
- Serrano, M., McDuffee, D., Robertson A.E. 2017. Seed treatment reduces damping-off caused by *Pythium sylvaticum* on soybeans subjected to periods of cold stress. Canadian Journal of Plant Pathology 40(4):571-579.
- Serrano, M., Mueller, T., Robertson, A.E. 2016. Comparison of soybean seed treatments in replicated strip trials at 10 locations in Iowa, 2014. Plant Disease Management Reports 9: FC169.
- Serrano, M., Sáenz, M.V., Vargas, A. 2003. Some postharvest characteristics of five diploids (*Musa* AA) and four triploids (*Musa* AAA, AAB) bananas. Revista CORBANA 29(56):1-15.
- Serrano, M., Umaña, G., Sáenz, M.V. 2011. Postharvest physiology, chemical composition and antioxidant capacity of peach palm fruit (*Bactris gasipaes* Kunth) cv. Tuirá Darién, harvested at three different ages. Revista Agronomía Costarricense 35(2): 75-87.

Published Abstracts

- Serrano, M. Robertson, A.E. 2017. The effect of cold stress on damping-off of soybean caused by *Pythium sylvaticum*. (Abstr.). Phytopathology 107:S5.1.
- Serrano, M., Robertson, A.E. 2016. Cold stress at planting increase susceptibility to damping-off caused by *Pythium sylvaticum*. (Abstr.). Phytopathology 106 (Suppl. 4) S4:40.
- Serrano, M., Robertson, A.E. 2015. Chilling injury during imbibition of soybean seed increases incidence of damping-off caused by *P. torulosum*. (Abstr.) Phytopathology 105 (Suppl. 4) S4:125.
- Tylka, G.L., Marrett, C.C., Robertson, A.E., **Serrano, M.** and Mueller, T.A. 2015. Effects of Clariva seed treatment on soybean cyst nematode (*Heterodera glycines*) population densities and soybean yields in Iowa. (Abstr.). Phytopathology 105 (Suppl. 4) S4:140.

Extension Publications

Robertson, A., Serrano-Porras, M., and Wiggs, S. 2016. Evaluations of commercial seed treatments on soybean at three locations in Iowa in 2015. Integrated Crop Management News

<http://bit.ly/25KV2ZM>

Serrano-Porras, M., Wiggs, S., and Robertson, A. 2015. Evaluations of commercial seed treatments on soybean at three locations in Iowa in 2014. Integrated Crop Management News

<http://bit.ly/22xFbtc>

Tylka, G., Robertson, A., Serrano-Porras, M., and Mueller, T. 2015. Field Experiments Show Effects of Clariva™ Seed Treatment in 2014. Integrated Crop Management News <http://bit.ly/1uneoVi>

References

1. Dr. Alison E. Robertson. Associate professor/Extension field crops pathologist. Department of Plant Pathology and Microbiology. Iowa State University. 313 Bessey Hall, Ames, IA 50011. mgleason@iastate.edu Phone: 515-294-0579.
2. Dr. Mark Gleason. Fruit and Vegetable research. Department of Plant Pathology and Microbiology. Iowa State University. 317 Bessey Hall, Ames, IA 50011. alisonr@iastate.edu Phone: 515-294-6708.
3. Dr. Gregorio Leandro. Plant Pathologist, independent consultant in Costa Rica and former Senior Plant Pathologist for Dole Fresh Food International. Grele5@yahoo.com Phone: +506-8879-4920.
4. Dr. Gerardina Umaña Rojas. Postharvest Pathologist. Postharvest Technology Lab. Agronomic Research Center. University of Costa Rica. gerardina.umana@ucr.ac.cr Phone: (506) 2511 3231.