Lucas K. Bobadilla

Curriculum Vitae

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Education

2019–2023: **Ph.D., Crop Sciences**, *University of Illinois*, Urbana-Champaign, IL, USA.
Research focuses on the use of genomics and transcriptomics to characterize the evolution of quantitative traits in weed species, including non-target side herbicide resistance and reproduction system.

Committee: Patrick Tranel, Alexander Lipka, Amy Marshall-Colon and Aaron Hager

2016–2019 : **Master of Science, Crop Science and Plant Breeding**, *Oregon State University*, Corvallis, OR, USA.
Thesis: Frequency, Distribution, Ploidy Diversity and Control Options of Herbicide Resistant Italian Ryegrass (*Lolium perenne* L. spp. *multiflorum* (lam.) Husnot) Populations in Western Oregon.

Committee: Carol Mallory-Smith, Andrew Hulting, Patrick Hayes and Marcelo Moretti

2010–2015 : **Bachelor of Science, Agronomy**, *University of Sao Paulo*, ESALQ, Piracicaba, SP - Brazil.
Comprehensive exposure to the core areas of agronomy along with a final year project on Herbicide resistance in weeds at UC Davis.

Publications

Journal Articles

2022 **Bobadilla, Lucas K.**, Darci A. Giacomini, Aaron G. Hager, and Patrick J. Tranel. Characterization and inheritance of dicamba resistance in a multiple-resistant waterhemp (*Amaranthus Tuberculatus*) population from illinois. ***Weed Science***, volume 70, pages 4–13, 2022.

2021 **Bobadilla, Lucas K.**, Andrew G. Hulting, Pete A. Berry, Marcelo L. Moretti, and Carol Mallory-Smith. Frequency, distribution, and ploidy diversity of herbicide-resistant Italian ryegrass (*Lolium perenne* spp. *multiflorum*) populations of western Oregon. ***Weed Science***, pages 1–33. Cambridge University Press, 2021.

2021 Marcelo L. Moretti and Hanson Bradley D. **Bobadilla, Lucas K.** Cross-resistance to diquat in glyphosate/paraquat-resistant hairy fleabane (*Conyza Bonariensis*) and horseweed (*Conyza Canadensis*) and confirmation of 2,4-d resistance in *Conyza Bonariensis*. ***Weed Technology***, pages 1–6. Cambridge University Press, 2021.

2021 Stephen O Duke, Ian Heap, Patrick J Tranel, and **Bobadilla, Lucas Kopecky**. How many ways can nature kill the goose that laid the golden egg?–the many mechanisms of evolved glyphosate resistance. ***Outlooks on Pest Management***, volume 32, pages 197–202. Research Information, 2021.

2021 Yousoon Baek, **Bobadilla, Lucas K**, Darci A Giacomini, Jacob S Montgomery, Brent P Murphy, and Patrick J Tranel. Evolution of glyphosate-resistant weeds. ***Reviews of Environmental Contamination and Toxicology***, pages 93–128. Springer, 2021.

2020 **Bobadilla, Lucas K.**, Andrew G. Hulting, Daniel W. Curtis, and Carol Mallory-Smith. Application of synthetic auxin herbicides to suppress seed viability of Italian ryegrass (*Lolium perenne* ssp. *Multiflorum*) in tall fescue seed production. ***Weed Technology***, volume 34, pages 489–497. BioOne, 2020.

2020 Andréia K. Suzukawa, **Bobadilla, Lucas K.**, Carol Mallory-Smith, and Caio ACG Brunharo. Non-target-site resistance in *Lolium* spp. globally: A review. ***Frontiers in Plant Science***, volume 11. Frontiers Media SA, 2020.

Submmited/processing manuscripts

2022 **Lucas K. Bobadilla, Yousoon Baek and Patrick J Tranel**, *Comparative transcriptomic analysis of male and females in the dioecious weeds Amaranthus palmeri and Amaranthus tuberculatus*.
Submitted to BMC Biology

2022 **Lennart Charton, Lucas K. Bobadilla, Susana Gonzales, Gudrun Lange, Marc Lohse, Sebastian Klie, Roland Beffa, Patrick J. Tranel, and Anita Küpper**, *Closing the gap: Complete characterization of iodosulfuron and mesosulfuron metabolism by CYP81A10v7 in European Lolium spp. populations*.
Submitted to Molecular Biology and evolution

2022 **Lucas K. Bobadilla**, *WeedR: A R shiny package for weed scientists*.
processing for submission

2022 **Lucas K. Bobadilla and Patrick J Tranel**, *Transcriptomics description of dicamba resistance in Amaranthus tuberculatus*.
processing for submission to Pest Management Science

2022 **Lucas K. Bobadilla Brent P. Murphy, Roland S. Beffa, Anita Küpper and Patrick J Tranel**, *Population structure and local adaptation of weedy Lolium spp. revealed by a continental transcriptomics study*.
processing for submission

In Conference Proceedings

2021 **Lucas K. Bobadilla** and Aaron Hager Darci Giacomini, Patrick Tranel. The first dicamba-resistance case in waterhemp (*Amaranthus tuberculatus*): Inheritance characterization and identification of candidate resistance genes from rna-seq. In *Proceedings of the 76th Annual Meeting of the North Central Weed Science Society, Grand Rapids, MI*, page 168. NCWSS, 2021.

2021 **Lucas K. Bobadilla** and Roland S. Beffa Patrick Tranel Brent P. Murphy, Anita Küpper. Population structure and adaptation of weedy *Lolium* spp. revealed by a continental transcriptomic study. In *Proceedings of the 76th Annual Meeting of the North Central Weed Science Society, Grand Rapids, MI*, page 52. NCWSS, 2021.

2021 Damilola A. Raiyemo and Patrick Tranel **Lucas K. Bobadilla**. Comparative genomics of dioecious *Amaranthus* species. In *Proceedings of the 76th Annual Meeting of the North Central Weed Science Society, Grand Rapids, MI*, page 119. NCWSS, 2021.

2020 **Lucas K. Bobadilla** and Patrick J Tranel. Transcriptomics-based identification of candidate genes responsible for reduced dicamba sensitivity in waterhemp (*Amaranthus tuberculatus*). In *Proceedings of the 75th Annual Meeting of the North Central Weed Science Society, Virtual*, page 78. NCWSS, 2020.

2020 **Lucas K. Bobadilla** and Patrick J Tranel Darci A. Giacomini. Characterization of dicamba cross resistance in a multiple-resistant waterhemp (*Amaranthus tuberculatus*) population from illinois. In *Proceedings Weed Science Society of America annual meeting, Maui, HI*, page 21. WSSA, 2020.

2019 **Lucas K. Bobadilla** and Andrew G. Hulting Carol Mallory-Smith Camila R. P. Lima, Pete A. Berry. The recent scenario of italian ryegrass herbicide resistance frequency and ploidy diversity in western oregon. In *Proceedings Western Society of Weed Science annual meeting, Denver CO*, pages 21–22. WSWS, 2019.

2018 Nami Wada and **Lucas K. Bobadilla,** Carol Mallory-Smith Jennifer Parke, Pete A. Berry. Comparison of solarization and biosolarization for weed control in a tree seedling nursery in western oregon. In *Proceedings Western Society of Weed Science annual .meeting, Garden Grove, CA*, pages 12–13. WSWS, 2018.

2018 **Lucas K. Bobadilla** and Andrew G. Hulting Carol Mallory-Smith Pete A. Berry, Dan W. Curtis. Frequency and distribution of herbicide resistant biotypes of italian ryegrass in the willamette valley of western oregon. In *Proceedings Western Society of Weed Science annual meeting, Garden Grove, CA*, page 65. WSWS, 2018.

2018 **Lucas K. Bobadilla** and Carol Mallory-Smith Dan W. Curtis, Andrew G. Hulting. Effects of synthetic auxin herbicides on seed production and seed viability of herbicide resistant populations of italian ryegrass in western oregon. In *Proceedings Western Society of Weed Science annual meeting, Garden Grove, CA*, page 24. WSWS, 2018.

2017 **Lucas K. Bobadilla** and Carol Mallory-Smith Andrew G. Hulting. Management of multiple resistant italian ryegrass - characterizing resistant populations. In *Proceedings Western Society of Weed Science annual meeting, Coeur d'Alene, ID*, page 24. WSWS, 2017.

Research Experience

Doctoral researcher

June, 2019 – present ***Evolutionary biology and quantitative trait evolution in agricultural weeds***.
Analysis of multi-scale Omics data studying weeds herbicide resistance evolution and identification of the dioecy genetic mechanism in amaranth species with the long-term goal to develop a genetic control management tool.

PI : **Dr. Patrick Tranel**, *Ainsworth Professor and Associate Head*, University of Illinois, Urbana-Champaign - Crop Sciences Department

Graduate research assistant

August, 2016 – May, 2019 ***Weed science and evolution of herbicide resistance in weeds***.
Agronomic weed management practices, herbicide resistance evolution, and spatial data analysis to understand herbicide resistance evolution and spread in Oregon.

PI : **Dr. Carol Mallory-Smith**, *Professor-emeritus*, Oregon State University - Crop Sciences Department

Research assistant

February, 2015 – 2016 ***Undergraduate research assistant - UC Davis Weed Science Lab***.
Agronomic weed management field and greenhouse experiments, herbicide translocation using radio-labeled products

PI : **Dr. Brad Hanson**, *Professor*, University of California, Davis - Plant Sciences Department

Teaching Experience

Fall, 2022 : **CPSC428: Weed Science Practicum**, University of Illinois.

Teaching Assistant: Online course taught during the COVID pandemic. This course aimed to teach students the basic concepts of weed science, ranging from ecology to management. I was responsible for grading, plant collection, and video recording used for the classes.

Spring, 2022 : **HRT892: Co-expression network analysis**, Michigan State University.

Guest lecture: Teaching the fundamentals of gene regulatory and co-expression networks. The main goal of the lecture was to teach the usage of WGCNA for co-expression analysis.

Spring, 2021 : **VEN250: Data analysis in agriculture**, Fresno State University.

Guest lecture: Teaching the fundamentals of data science in agriculture with a focus on data wrangling and visualization in R.

Spring, 2020 : **CPSC220: Introduction to weed science**, University of Illinois.

Teaching Assistant: Practical class to familiarize students with all aspects of weed science, from plant biology to management practices. I was responsible for running labs, applying quizzes, and teaching lectures.

Fall, 2018 : **PBG530: TA - Plant genetics**, Oregon State University.

Teaching Assistant: Class consisted of advanced topics about plant genetics such as GWAS, QTL mapping, and quantitative genetics. This was a hybrid course for senior undergrads and graduate students with extra material for the graduate students, including a weekly paper discussion.

Fellowships & Awards

2016 ***William Kent Wiley, Jr. Memorial Fellowship*** of Oregon Seed Growers Commission.

2017 ***Crop and Soil Science Travel Award*** to attend WSSA conference.

2018 ***Larry C. Burrill Memorial Scholarship*** from the OSU Crop Science Department.

2018 ***Outstanding student Scholarship*** from the Oregon Weed Science Society.

2018 ***Award*** 2nd place of the Poster contest at the WSWS annual meeting.

2019 ***Award*** 1st place of the Poster contest at the WSWS annual meeting.

2019 ***Award*** Elena Sanchez Memorial WSWS Outstanding Student Award.

2020 ***Award*** 2nd place of the Poster contest at the WSSA annual meeting.

2021 ***Award*** 1st place of the Poster contest at the NCWSS annual meeting.

2022 ***Fellowship*** College of ACES Johnathan Baldwin Turner (JBT) Fellowship.

2022 ***Scholarship*** Corteva New Frontiers Scholar for sustainable agriculture improvement

Skills

Programming: R, Python, Bash, Julia, Docker, SQL

Bioinformatics: RNA-seq, genome sequencing, resequencing, GWAS, QTL mapping, eQTL, Gene regulatory network

Agronomy: Weed management, Plant breeding, Soil Fertility, Pest management, farm equipment use, field trial implementation

Data science: Data visualization, machine learning, mixed model, logistic model, random forest, Bayes, LASSO, Quarto, Shiny, Jupyter notebook

Software: Microsoft office, Tableau, ArcGIS, Cytoscape, IGV, ImageJ, ARM, Adobe Photoshop, Adobe Illustrator, Linux, RaspberryPi

Language fluency	English, Portuguese

Institutional services

2017	**Evaluation Committee for Promotion and Tenure**, OSU.
Student rep:	Graduate student representative for evaluation and decision for faculty promotion and tenior
2018-2020	**Board member of the Western Society of Weed Science**, WSWS.
Student liaison:	Graduate student liaison at the WSWS board. Roles involved organizing student events during the annual meeting and helping with board decisions.
2020-present	**Corteva Plant Science symposium**, UIUC.
Board member:	Graduate students group organizing the Corteva Plant Science symposium. Responsibilities include website development, speaker search and general symposium tasks.
2022-present	**Crop Sciences Departmental Advisory Committee**, UIUC.
Graduate student rep:	Graduate student representative at the Crop sciences department. Responsibilities include participation in the monthly meetings to discuss important decisions for the department.
2022-present	**Graduate student representative at the Crop sciences Inclusion, Diversity, Equity, and Access committee**, UIUC.
Graduate student rep:	Graduate student representative at the Crop sciences department. Responsibilities include participation in the monthly meetings to discuss important decisions for the department.

References

Dr. Patrick J Tranel
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Dr. Brad Hanson
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