

## Paulo Izquierdo

Michigan State University

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Department of Plant, Soil and Microbial Sciences

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### EDUCATION

- 2017-present **Ph.D. Degree**, Michigan State University, Plant Breeding Genetics and Biotechnology, Dissertation Title: “Exploring the genetic architecture and improving genomic prediction accuracy for yield, mineral concentration, and canning quality traits in common bean.”
- 2010 **B.S. Degree**, Universidad del Tolima, with Distinction, Biology, Thesis title: “Use of the advanced backcross-QTL method to transfer seed mineral accumulation nutrition traits from wild to Andean cultivated common beans.”

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### RESEARCH AND PROFESSIONAL EXPERIENCE

- 2017-present Graduate research assistant, Dissertation Title: “Exploring the genetic architecture and improving genomic prediction accuracy for yield and end-use quality traits in common bean.” Michigan State University. Advisor: Karen Cichy
- 2016 Visiting Scholar, “Development of molecular markers linked to anthracnose resistance in common bean.” Michigan State University. Advisors: James Kelly and Karen Cichy
- 2013-2016 Research assistant, “Fine-mapping of QTLs associated with minerals concentration in common bean and Genome-wide association mapping for agronomic traits in a Multiparent Advance Generation Intercross population.” CIAT. Advisor: Bodo Raatz
- 2011-2013 Research assistant, “QTL analysis and chloroplast transformation in sugarcane.” Colombian Sugarcane Research Center. Advisor: Jershon Lopez
- 2010 Visiting researcher, “Use of molecular marker assisted selection for resistance to anthracnose in common bean.” CIAT/Universidad Nacional de Colombia. Advisor: Matthew Blair
- 2009-2010 Undergraduate Research Assistant, “Use of the advanced backcross-QTL method to transfer seed mineral accumulation nutrition traits from wild to cultivated common beans. CIAT. Advisor: Matthew Blair.

## PUBLICATIONS

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1. Sadohara, R; **Izquierdo, P**; Alves, F; Porch, T; Beaver, J; et al. The *Phaseolus vulgaris* Yellow Bean Collection: Genetic diversity and characterization for cooking time. **Submitted**
2. Diaz, S; Ariza-Suarez, D; **Izquierdo, P**; Lobaton, JD; de la Hoz, JF; et al. Genetic mapping for agronomic traits in a MAGIC population of common bean (*Phaseolus vulgaris* L.) under drought conditions. BMC Genomics. **2020**.
3. Berry, M; **Izquierdo, P**; Jeffery, H; Shaw, S; Nchimbi-Msolla, S and Cichy, K. QTL analysis of cooking time, seed attributes, and protein concentration in a recombinant inbred dry bean (*Phaseolus vulgaris* L.) population grown in two agro-ecological zones in Tanzania. Theor. Appl. Genet. **2020**.
4. **Izquierdo, P**; Astudillo, C; Blair, M; Iqbal, A; Raatz, B and Cichy, K. Meta-QTL analysis of seed iron and zinc concentration in common bean (*Phaseolus vulgaris* L.) Theor. Appl. Genet. **2018**.
5. **Izquierdo, P**; Shaw, S; Berry, M and Cichy K. A saturated genetic linkage map of common bean (*Phaseolus vulgaris* L.) developed using Genotyping by Sequencing (GBS). Annual report of the Bean improvement cooperative. **2017**.
6. Perea, C; De la Hoz, J; Cruz, J; Lobaton, J; **Izquierdo, P**, et al. Bioinformatic analysis of genotype by sequencing (GBS) data with NGSEP. BMC Genomics. **2016**.
7. Blair, M; **Izquierdo, P**; Astudillo, C and Grusak, M. A. Legume Biofortification Quandary: Variability and genetic control of seed coat micronutrient accumulation in common beans. Front. Plant Sci. **2013**.
8. Delgado, H; Pinzón, E; Blair, M and **Izquierdo, P**. Evaluation of bean (*Phaseolus vulgaris* L.) lines result of an advanced backcross between a wild accession and Radical Cerinza. U.D.C.A Act. & Div. Cient. **2013**.
9. **Izquierdo, P**; A. Gutiérrez; J.I. Victoria; M.C. Ángel and J. López: Molecular markers associated with resistance to Sugarcane yellow leaf virus. Proceedings International Society Sugar Cane Technologists. **2013**.
10. Blair, M and **Izquierdo, P**. Use of the advanced backcross-QTL method to transfer seed mineral accumulation nutrition traits from wild to Andean cultivated common beans. Theor. Appl. Genet. **2012**.
11. Blair, M; **Izquierdo, P**; Astudillo, C; Monserrate, F; Cortés, M, et al. Utilization of near infrared spectrophotometry (NIRS) analysis for evaluation of mineral content in Andean bean samples. Annual report of the Bean improvement cooperative. **2011**.

## ORAL AND POSTER PRESENTATIONS

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1. **Izquierdo, P**; Lopez, M; Kelly, J; Cichy, K. Assessing Genomic Selection Prediction Accuracy for Yield and End-Use Quality Traits in Black Beans. Bean improvement cooperative. **Poster. 2019**.
2. **Izquierdo, P**; Katuuramu, D; Cichy, K. Genomic selection for nutritional traits and cooking time in common bean) using Genotyping by Sequencing. Plant & Animal Genome. **Poster. 2019**.

3. **Izquierdo, P;** Astudillo, C; Iqbal, A; Blair, M; Raatz, B and Cichy, K. Meta-QTL Analysis in Common Bean to Uncover the Genetic Architecture of Iron and Zinc Concentration in Seed. Plant & Animal Genome. **Poster. 2018.**
4. **Izquierdo, P;** Shaw, S; Berry, M and Cichy K. A saturated genetic linkage map of common bean developed using Genotyping by Sequencing (GBS). Bean improvement cooperative. **Poster. 2017.**
5. **Izquierdo, P;** Lobaton, J; Mayor, V; Grajales, M; Cajiao, C; Duitama, J and Raatz, B. Genome-wide association mapping for yield and other agronomic traits in a Multi-parent advanced generation inter-cross population of Mesoamerican common bean (*Phaseolus vulgaris* L.). IX Latin American and Caribbean Agricultural and Forestry Biotechnology Meeting, Peru. **Oral presentation. 2016.**
6. **Izquierdo, P;** Gutiérrez, A; Victoria, J; C; Ángel, López, J; Avellaneda, C. Molecular markers associated with resistance to the sugarcane yellow leaf virus. XXVIII International Society of Sugarcane Technologists (ISSCT). Brazil. **Oral presentation. 2013.**
7. **Izquierdo, P;** Gutiérrez, A; Victoria, J; Ángel, J; López, J; Avellaneda, C. Molecular markers associated with resistance to the sugarcane yellow leaf virus. IX Association for Sugarcane Technology in Latin America and the Caribbean (Atalac-Tecnicaña). Colombia. **Oral presentation. 2012.**
8. **Izquierdo, P;** Gutiérrez, A; Avellaneda, C; Victoria, J; Ángel, López, J. Molecular markers associated with resistance to the sugarcane yellow leaf virus. Colombian and Latin American Phytopathological Association. Colombia. **Oral presentation. 2011.**

#### **HONORS, AWARDS, AND FELLOWSHIPS**

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| 2021 | NSF Research Traineeship – Integrated training model in plant and computational sciences fellowship.   |
| 2021 | Everett and Jane Everson fellowship in Plant Breeding.   |
| 2021 | Jason and Dana Lilly fellowship in Plant Breeding, Genetics & Biotechnology.   |
| 2021 | Norman and Jessie Thompson fellowship in Crop and Soil Sciences.   |
| 2021 | College of Agriculture and Natural Resource fellowship, Michigan State University.   |
| 2020 | Bayer Diversity Initiative Scholar.  |
| 2019 | Everett and Jane Everson fellowship in Plant Breeding.   |
| 2019 | Norman and Jessie Thompson fellowship in Crop and Soil Sciences.   |
| 2019 | Graduate student language fellowship in undergraduate teaching and learning Residential College in the Arts and Humanities, Michigan State University. |
| 2019 | Council of graduate students, Conference Award, Michigan State University.   |
| 2018 | The Crop and Soil Science Graduate award, Michigan State University.   |
| 2018 | Jason and Dana Lilly fellowship in Plant Breeding, Genetics & Biotechnology.   |
| 2018 | Elmer C. Rossman fellowship in Plant, Soil & Microbial Science.  |
| 2018 | Everett and Jane Everson fellowship in Plant Breeding.   |
| 2018 | Resilient and Nutritious dry beans for Africa fellowship, USDA-FAS.  |
| 2017 | Doctoral Fellowship Program. COLCIENCIAS, Colombia's Administrative Department of Science, Technology, and Innovation.                                 |

## **PEDAGOGICAL EXPERIENCE & MENTORING**

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- 2021 Workshop Instructor: Quantitative Genetics, Feed the Future Innovation Lab for Crop Improvement (Eastern Africa) <https://pauloizquierdo.github.io/QuantitativeGenetics/>
- 2021 Workshop Co-Instructor: Data visualization with R, Universidad Industrial de Santander (Colombia). <https://compasscol.github.io/dataviz/>
- 2021 Workshop Co-Instructor: Introduction to R, Universidad Industrial de Santander (Colombia). <https://compasscol.github.io/IntroR/>
- 2019 Spanish Language Assistant: Residential college in the arts and humanities, program on sustainability in Costa Rica, Michigan State University.
- 2019 Teaching assistant: Department of plant, soil and microbial sciences, Introduction to plant genetics (CSS350), Michigan State University
- 2018 As a research assistant, I mentored an USDA Borlaug fellow in lab-based research, Michigan State University. Trainee: Winnyfred Amongi.
- 2015-2016 As a research assistant, I mentored 2 undergraduates in greenhouse and lab-based research, CIAT. Trainees: Wilson Santiago, Laura Paz.

## **SYNERGISTIC ACTIVITIES**

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- 2020 Co-Founder, Community Platform for Agricultural Sciences (COMPASS). Website: <https://compasscol.github.io/>
- 2020 Co-Organizer, Ciencia en línea: impulsando el uso de plataformas para la divulgación, colaboración e inspiración científica, symposium, SOCOLEN
- 2019 Co-Organizer, Phenomic Application in Plant Breeding, Corteva-PBGB symposium.

## **MEMBERSHIPS**

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Bean Improvement Cooperative  
Crop Science Society of America  
American Society of Agronomy

## **REFERENCES**

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- Dr. Karen Cichy Associate adjunct professor  
Michigan State University; Department of Plant, Soil and Microbial Sciences  
[cichykar@msu.edu](mailto:cichykar@msu.edu)
- Dr. Bodo Raatz Common bean breeder  
International Center for Tropical Agriculture (CIAT)  
[bodoraatz@gmail.com](mailto:bodoraatz@gmail.com)
- Dr. Robin Buell University Distinguished Professor  
Michigan State University; Department of Plant biology  
[buell@msu.edu](mailto:buell@msu.edu)